Syllabus

MBBS

at the AIIMS



All India Institute of Medical Sciences
Ansari Nagar, New Delhi- 110029

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All India Institute of Medical Sciences

New Delhi - 110 029

Academic Affairs
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PREAMBLE

The Health Survey and Development Committee, popularly known as the Bhore Committee, in its report published in 1946, recommended very strongly the establishment of a national medical center at Delhi which will concentrate on training of highly qualified teachers and research workers in order that a steady stream of these could be maintained to meet the needs of the rapidly expanding health activities throughout the country. After the attainment of independence the Union Ministry of Health proceeded to implement this challenging idea and a magnificent grant of one million pounds by the Government of New Zealand through the Colombo Plan helped to translate the idea into reality. An act of Parliament in 1956 established the All India Institute of Medical Sciences as an Autonomous Institution of National importance and defined its objectives and functions.

The prime concern of the Institute is to develop patterns of teaching in undergraduate and postgraduate medical education in all the branches so as to demonstrate a high standard of medical education to all medical colleges and other allied institutions in India. This educational experience is imparted in an atmosphere of research.

By virtue of the Act, the Institute grants its own medical degrees and other academic distinctions. The degrees granted by the Institute under the All India Institute of Medical Sciences Act are recognized medical qualifications for the purpose of the Indian Medical Council Act and, notwithstanding anything contained therein, are deemed to be included in the first schedule of that Act, entitling the holders to the same privileges as those attached to the equivalent awards from the recognized Universities of India respectively.

The syllabus for MBBS has been developed in consultation with the faculty of the concerned departments and further scrutinized by the Academic Section under the supervision of the Dean (Prof. P. Venugopal).

CONTENTS

INTRODUCTION

All India Institute of Medical Sciences (AIIMS) was established by the Act of Parliament in 1956 as an autonomous institute to set patterns in Undergraduate and Postgraduate Medical Education in all its branches to so as to demonstrate a high standard of medical education. This is the only institute outside the jurisdiction of Medical Council of India to encourage experiments in the curriculum. The Course leading to the Degree of MBBS has been in existence since 1956. It mainly follows a disciplinary structure. However, since inception, AIIMS has been constantly upgrading its course content in tune with the changing needs. Many alterations have taken place during the last fifty years, which have been reflected in the present curriculum document.

Duration

The MBBS course comprises four and a half years, followed by compulsory rotatory internship of one year. The course follows semester system, each semester consisting of six months. The MBBS course is divided in to three phases, viz., Pre-clinical, Para-clinical and Clinical Phase, during which following subjects are introduced:

Phase	Semesters	Subjects covered
Pre-clinical	1 – 2 : Two Semesters	Anatomy, Bio-chemistry, Physiology
Para-clinical	3 – 5 : Three Semesters	Community Medicine; Forensic Medicine, Pathology, Pharmacology, Microbiology, Clinical postings in wards, OPDs to begin here;
Clinical	6 – 9 : Four Semesters	Community Medicine, Medicine and allied subjects (Psychiatry, Dermatology); Obst. Gynae.; Pediatrics; Surgery and allied subjects (Anesthesiology, E.N.T., Ophthalmology, Orthopedics); Clinical postings;

Examination Schedule

There shall be three professional examinations as follows:

First Professional Exam.	End of 2nd Semester
Second Professional Exam.	End of 5th Semester
Final Professional Exam.	End of 9th Semester

In addition, Mid – Semester, End – Semester Examinations and End – posting assessments are held regularly.

The total weightage to the internal assessment is 50%, both in the theory and practical /clinical assessment.

Goals and objectives of undergraduate course (MBBS)

At the end of the MBBS course, the learner shall be able to:

1. Diagnose and manage common health problems of the individual and the community appropriate to his/her position as a member of the health team at primary, secondary and tertiary levels;
2. Be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems;
3. Practice Evidence Based Medicine, appreciating the rationale for different therapeutic modalities and be familiar with the administration of “essential drugs” and their common side effects;
4. Appreciate the psycho-social, cultural, economic, and environmental factors affecting health, and develop humane attitude towards the patients/relatives, in discharging one’s professional responsibilities;
5. Be familiar with the various National Health Programs, and the ways in which they are being implemented;
6. Acquire basic management skills in the area of materials, financial and human resources;
7. Demonstrate communication skills, both verbal and written to establish effective communication with the clients (patients, relatives, and general public), health team partners, and scientific community;
8. Practice medical ethics in patient care, service delivery, and research.
9. Develop attitude for self learning and acquire necessary skills including the use of appropriate technologies, for pursuing self directed learning for a life time.

ANATOMY

Total duration of course is one year. It comprises of two semesters I and II. Each semester is of six months duration.

Course commences from 1st August every year and ends on 15 June following year.

The subject of anatomy is taught under the following heads :

1. Gross anatomy
2. Microanatomy
3. Embryology and Genetics
4. Neuroanatomy

Total number of teaching hours are approximately **541.**

Distribution of teaching hours for theory and practicals are as follows :

	Subject	**Approximate No. of hours taught**
1.	**Gross Anatomy**	
	Lectures	38
	Practicals	349
2.	**Microanatomy**	
	Lectures	20
	Practicals	43
3.	**Embryology**	
	Lectures	21
	Practicals	18
	Genetics	
	Lectures	5
	Practicals	1

4. Neuroanatomy

Lectures	19
Practicals	27
Total No. of teaching hours in Anatomy (Theory and Practicals)	**541**

OBJECTIVES

At the end of the course, the student should be able to:

- Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of the various structures in the body.
- Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.
- Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems. He/She should be able to locate the site of gross lesions according to the deficits encountered.
- To understand the basic principles of embryology including genetic inheritance and stages involved in development of the organs and systems from the time of conception till birth. The student should recognise the critical stages of normal development and the effects of common teratogens, genetic mutations and environmental hazards on it. He/She should be able to explain the developmental basis of the occurrence of major variations, abnormalities and congenital anomalies.

COURSE CONTENT

1. Gross Anatomy

Introduction to Anatomy, nomenclature, anatomical position, planes, tissues and movements.

I. Osteology

(a) Names of the bones of the body and their position; classification of the bones with examples; general features of the bone and normal development; microscopic anatomy of bone; general pattern of blood supply; ossification of the bones of the limbs for age determination. X-rays of bones.

(b) Process of repair of bone.

2. Muscular System

(a) Classification and identification of the muscles of the body: main attachments, nerve supply and action(s), microscopic anatomy of muscles and the nerve terminations.

(b) Details of attachments of the muscles; ultrastructural features of muscle; mechanism of the movement caused by the muscle/muscles and various forces exerted by them and their detailed action(s).

3. Arthrology

(a) Definition and classification of joints, general features of different types of joints; detailed study of major joints of the limbs and movements performed at various joints in the body.

(b) Microscopic anatomy of articular cartilage; maintenance of articular cartilages; blood supply and nerve supply of the joints.

4. Cardio Vascular System

(a) Normal position, external features and parts of the heart; internal features of the chambers of heart, names of the blood vessels and venous drainage of the organs, structures and body as a whole, conducting system of heart, fibroskeleton of heart.

(b) Variation(s), developmental anomalies of heart and blood vessels, valvular defects and their effects in pathogenesis of the anomalies.

5. Respiratory System

(a) Position, parts, relations, blood supply of upper and lower respiratory tract. Pleura, its reflection, nerve supply, pleural recesses and their significance, bronchopulmonary segments, their importance.

(b) Mechanism of respiration

6. Digestive System

(a) Position, extent, parts, relations, blood supply, nerve supply, lymphatic drainage and sphincters of the gastrointestinal system.

(b) Sphincteric action including functional implications.

7. Genito-Urinary System

(a) Parts, position, relations, blood supply, nerve supply and lymphatic drainage of uterus, cervix, vagina, ovary, ovarian duct, testes, epididymis, seminal vesicle, ductus deferens, prostate, kidney, ureter, urinary bladder and urethra

(b) Innervation of urinary bladder in detail

8. Endocrine System and Individual Endocrine Glands

(a) Various endocrine glands, their location, relations, blood supply, nerve supply and lymphatic drainage.

(b) Clinical manifestations of common endocrine disorders.

9. Nervous System and its components

(a) Parts of nervous system, neuron meninges, nerve terminals, neuroglia, myelination, degeneration and regeneration, ventricles, CSF, spinal cord and its blood supply. Motor and sensory pathways, cranial nerves, thalamus, cerebellum, limbic and autonomic pathways. Functional cortical areas, motor and sensory cortex and their blood supply.

10. Special Sensory Organs

(a) Gross Anatomy of :

- (i) eye ball, extra ocular muscles their nerve supply and actions (s)
- (ii) ear
- (iii) nose

(iv) tongue, its musculature blood supply and lymphatic drainage.

11. Lymphatic System

(a) Location of the major groups of the lymphnodes of the body and their drainage areas. Gross anatomy of the major lymphatics specially thoracic duct and its tributaries.

12. Surface Anatomy

(a) Surface features of the body and projection of the outline of heart, its borders, surfaces and valves, lungs, their borders, fissures and hila, pleura, liver, kidneys and various abdominal and pelvic organs and important vessels and nerves

13. Cross Sectional Anatomy

Cross sections of thorax, abdomen and pelvis to understand the interrelationship of organs and structures.

II. Microanatomy

Microscope and basic principles of microscopy, commonly used stains, basophilic and acidophilic staining reactions and their significance. Commonly encountered artifacts. Brief principle of electron microscopy and interpretation of ultrastructural features.

GENERAL HISTOLOGY

Cell : detailed structure of cell and its components and their functional mechanisms.

Four primary tissues

Epithelium **:** Microscopic characteristics, types, functions, distribution, basal lamina, cell junctions, specialization of the cell surface and their structural details and functions; metaplasia.

Connective tissue : Cells, fibers and their structural features and functions. Intercellular substances, amorphous ground substance, types of connective tissue (loose areolar tissue, dense connective tissue) and their distribution. *Specialized connective tissue* : different types of cartilages and their functions and distribution. *Bone* : Cells, bone matrix, structural features of compact and cancellous bone, their distribution and functions, ossification, blood supply of a long bone.

Muscle : General features, detailed structure of : skeletal muscle, and molecular mechanisms of contraction, innvervation of skeletal muscle, neuromuscular junction, morphological and histochemical basis of classification into type I and type II muscle fibers and their significance, structural and functional characteristics of cardiac and smooth muscle; innvervation of cardiac and smooth muscle.

Nervous tissue *:* Structural characteristics of a neuron, axon and dendrties. Different types of neurons and their specific structural and functional features and distribution. Axonal transport, synapse, morphological and functional characteristics of different types of synapses. Neuroglia : types, structure and functions, blood brain barrier. Brief cytoarchitecture of the central nervous system, regeneration in CNS with particular emphasis on stem cells. Sensory and autonomic ganglia, peripheral nerves, myelin and myelination, degeneration and regeneration in peripheral nerves.

Histology of various organs/organ systems

Exocrine glands : Characteristics, simple and compound glands; types of secretions, modes of secretion, detailed structural features of a serous secreting cell and mucous secreting cell, serous and mucous acini, duct system, features of salivary glands, exocrine pancreas, sweat and sebaceous glands, mammary gland, bulbourethral gland etc.

Circulatory system : Structural features of heart; conducting and distributing arteries and arterioles; types of capillaries, their structural features and distribution and microcirculation, detailed structure of endothelium; structural characteristics of large and small veins and venules arterio-venous shunts, lymphatics.

Respiratory system : Structural features of nose, nasopharynx, larynx, trachea, principal brochi, lung including intrapulmonary bronchi, bronchioles, alveolar ducts, atria, alveoli, blood-air-barrier. Functions of different parts of respiratory system.

Skin and nerve-end-organs : Thick, thin and hairy skin, cell renewal and pigmentation of skin, skin appendages, healing of skin wounds, sensory receptors of skin. Functions of skin.

Immune system and lymphoid organs : Lymphocytes, their subtypes and functions. Humoral and cell mediated immunity. Thymus, lymph nodes, spleen, tonsils and other mucous associated lymphoid follicles.

Digestive system (GIT) : General organization, oral cavity, lip, cheek, tongue, taste buds, associated salivary glands. Layers of tubular digestive tract, esophagus, stomach, small intestine, gastroesophageal junction, gastroduodenal junction, large intestine, anal canal and rectoanal junction. Liver, internal organization of liver, liver lobule, liver acinus, significance of zonation in liver acinus, liver sinusoids, detailed structure of hapatocyet, bile canaliculi, bile ducts, gall bladder, bile duct and pancreas.

Endocrine glands : Thyroid, parathyroid, Islets of Langerhan's gland, adrenal cortex and medulla, their structural details, functional mechanisms, hypophysis cerebri, cell types secretion and their functions, hypophyseal portal circulation, common endocrine disorders

Urinary system : Detailed microscopic structure of kidney, cortex, medulla, pyramids, medullary rays, cortical columns, glomerulus, nephron, glomerular filtration juxtaglomerular apparatus, its structural features and functions, renal interstitium, collecting ducts, renal sinus, minor and major calyces, microcirculation of kidney, histophysiology of the kidney, renal pelvis and ureters, urinary bladder and urethra.

Female reproductive system : Ovary, ovarian stroma, primary and secondary graafian follicles, functions of various constitutents and structural details of graafian follicles, atretic follicles, corpuluteum and its functions, corpus albicans. Oviducts, uterus, arterial supply of uterus, cyclic changes in uterine endometrium, fertilization, vagina, female external ganitalia and mammary glands.

Male reproductive system : Testes, spermatogenesis, spermatozoon, cycle of seminiferous epithelium, sertoli cells, interstitial tissue Leydig cells, histophysiology of testes, epididymus, vas deferns, prostrate, seminal vesicles, penis.

III. Embryology

III. A General Embryology

(a) Definition of embryology; gestation period: definition of gamete sperm, Ovum; gametogenesis, migration of primordial germ cells into gonadal ridge; spermatogenesis; structure of sperm, oogenesis; structure of ovum; growth of ovarian follicles, ovarian and uterine cycles.

(b) Sperm in the male genital tract; sperm in the female genital tract, activation and capacitation of sperm in the female genital tract.

(c) ***First Week of Development***

Definition and normal site and process of fertilisation, formation of zygote, cleavage division; formation of morula and blastocyst.

(d) **Second Week of Development**

Differentiation of embryoblast and trophoblast; changes in the embryoblast formation of bilainar germ disc; changes in the trophoblast; formation of cytotrophoblast, syncytiotrophoblast, amniotic membrane, yolk sac, extra embryonic mesoderm and extra embryonic coelom and connecting stalk; formation of chorion, amniotic cavity, primary yolk sac cavity appearance of prochordal plate.

Implantation; formation of decidua, types of implantation and abnormal sites of implantation

(e) **Third Week of Development**

Appearance of primitive streak and primitive node; formation of intraembroynic mesoderm resulting in trilaminar germ disc; gastrulation formation of notochord, buccopharyngeal and cloacal membranes, paraxial, intermediate and lateral plate mesoderm, secondary yolk sac, intraembryonic coelom and allantoic diverticulum; derivatives of ectoderm, mesoderm and endoderm.

(f) ***Fourth To Eighth week of Development (Embryonic period)***

Formation of somites, neural tube, cephalocaudal folding, lateral foldings, body form, stomodeum, proctodeum, gut and vitelline duct; subdivisions of gut into foregut, midgut and hindgut.

Development from third month to birth (Fetal period)

(g) Maturation of tissues and organs and rapid growth of body.

(h) Estimation of age.

Placenta

(i) Formation of placenta and chorionic villi, decidua basalis; features and functions of placenta; placental circulation; abnormalities; placental barrier; placentome, types of placenta.

Umbilical Cord

(j) Formation of umbilical cord; features of umbilical cord.

Amniotic Cavity

(k) Amniotic cavity and membrane; amniotic fluid – functions, expansions of amniotic cavity and fusion with chorion; chorion laeve with decidua capsularis; decidua capsularis with parietalis; obliteration of chorionic and uterine cavities; function of fused foetal membranes to dilate cervical canal.

(l) Abnormalities; obliteration of chorionic and uterine cavities; abnormalities of chorion.

(m) Formation of twins and types of twins.

(n) Arrangement of foetal membranes. Conjoined twins.

Teratology

(o) Genetical and environmental factors as causative factors for congenital malformations.

(p) Mode of actions of teratogenes and critical periods.

III.B Systemic Embryology

(a) Development of the individual organs of digestive system, genital system, urinary system,, respiratory system, cardiovascular system. Nervous system, special sensory organs, endocrine glands and mammary gland.

(b) Developmental abnormalities of individual organs/systems, pathogenesis of the anomalies.

(c) Histogenesis of various organs.

(d) Development of skeletal system, muscular system and derivatives of coelomic cavaties

(e) Development of face and the pharyngeal arches and the associated congenital anomalies.

III.C Human Genetics

(a) Cell, cell division, mitosis and meiosis, nucleus, DNA, chromosomes, classification, karyotype, chromosomal aberrations (Klinefelter, Turner and Down's Syndrome) Prenatal diagnosis for congenital abnormalities, sex determination.

(b) Pedigree chart, pathogenesis of chromosomal aberrations and their effects, recombinant DNA, genetic inheritance, genetic counselling, inborn errors of metabolism.

PRACTICALS

Gross Anatomy

Upper Limb: Dissection: Pectoral and scapular, axillary and shoulder region, arm, forearm.

Prosected parts: Joints, Palm and dorsum of hand.

Thorax : Dissection: Chest wall, mediastinum, pleura, lungs, heart.

Abdomen: Dissection: Anterior abdominal wall and inguinal region, external genitalia. Viscera and Posterior Abdominal wall and nerve plexus.

Pelvis: Dissection : Pelvic viscera, blood vessels and nerves.

Prosected Parts: Perineum including ischio-rectal fossa.

Lower Limb: Dissection: Gluteal region, front and back of thigh popliteal fossa, front back and lateral side of leg and dorsum of foot.

Prosected Parts: Sole of the foot and joints

Head & Neck: Dissection: Superficial and deep dissection of face and neck, orbit and eye ball. Submandibular region temporal and infratemporal fossa, cranial cavity, naso and oropharyngeal regions. Ear,. Larynx and pharynx.

Neuro Anatomy

Gross specimen of full brain, meninges, spinal cord, prosected specimens to demonstrate visual system, auditory and vesibular pathways and major functional areas.

Stained sections of brain and spinal cord at various levels to demonstrate cranial nerve nuclei, ascending and descending tracts, thalamic nuclei and important functional areas.

Demonstrations

- Bones of skull and vertebral column
- Brain and spinal cord
- Cross-sectional anatomy
- Radiological anatomy
- CT and MRI scan

Microscopic Anatomy

- Routine and special stained slides of all the tissues and organs of body.
- Electronmicrographs to demonstrate filtration barrier of kidney, alveolar septum, tight junctions of capillaries and such relevant areas.

Developmental Anatomy

- Models to demonstrate various stages of early foetus and different organ development.
- Slides of ovary and testis to show follicles and stages of maturation of spermatozoa: early chick and pig embryos to understand the development of tissues and organs from conception till term.

Genetics

Demonstration of normal karyotype and common abnormal conditions including banding; Pedigree chart, syndromes and their clinical phenotype. Demonstration of various new techniques such as FISH.

Skills

1. Demonstrate surface markings of important organs.
2. Localise important pulsation and the structures against which pressure can be applied in case of bleeding from a particular artery.
3. Demonstrate muscle testing and movements at joints.
4. Locate sites for : Lumbar puncture, sternal puncture, pericardial tapping, liver biopsy.
5. Locate veins for venae puncture.
6. Locate the site for emergency tracheostomy.
7. Locate the subcutaneous positions of large veins.

TEACHING AND LEARNING METHODOLOGY

Departmental Faculty and Staff emphasizes on teaching basic fundamentals of Gross anatomy, Microscopic anatomy and its correlation with function, developmental anatomy and anatomical basis of occurrence of congenital defects, nerve lesions and its anatomical basis and the applied aspects of relevant clinical conditions.

All divisions of Anatomy i.e. Gross, Histology, Embryology, Genetics and Neuroanatomy are taught with the help of didactic lectures on specific topics followed by dissection / practicals. The general pattern of teaching methodology followed by all the faculty members and teaching staff in the department is :

1. Didactic Lectures : discussing the topic in detail in one hour lecture time.

Practicals

Learning objectives are given to students before each session.

2. Dissection : is done by students on the cadavers and is being assisted/supervised by a team of teachers. Some prossected specimen/dissection are shown on Ultrascope which is telecasted on TV monitors fitted in dissection Hall.
3. Video tapes of some dissections are also shown on TV after the completion of dissection of the part/ region to recaptulate the details of the part/region dissected.
4. Cross sections of whole body and brain are shown to correlate with MRI. X-rays are shown after dissection of each region.
5. Self assessment MCQs are given at the end of dissection of each region and discussed with teachers in-charge.
6. Handouts are given at the end of completion of part/region to the students to recaptulate and remember the Gross anatomy, Neuroanatomy, Embryology and Histology.
7. In microanatomy, a preview of the slides is given on TV monitor in small groups to understand the structural details of tissue/structure/organ.
8. In embryology, the serial sections of early chick embryos and pig embryos are demonstrated to understand the sequence of events involved in development of various systems and to understand the developmental basis of occurrence of various congenital abnormalities. Computer assisted programs for understanding the normal development of organ/systems is also demonstrated. Specimen and models depicting normal development of system are shown.
9. In genetics, the phenotype photographs, karyotyPes and pictures of various banding techniques are shown to understand the chromosomal abnormalities and various syndromes.
10. In Neuroanatomy, the stained sections at various levels of brain and spinal cord are shown on slides and computers to localize the cranial nerve nuclei and trace the origin, course and termination of ascending and descending tracts in order to understand the effects produced as a result of lesions.
11. Case studies of neural lesions are discussed to understand the location and level of lesions.
12. Demonstrations : Mainly the bones of the entire body, few dissected specimen are taught in small groups.

    By a combination of the above teaching-Learning tools and modalities the student is able to understand the development, gross and microscopic structure of the organ systems and gain an insight into the structure-function correlation. This combined with the knowledge of applied/clinical anatomy provides an understanding of the anatomical basis of health and disease.

LIST OF BOOKS RECOMMENDED

I. Gross Anatomy

1. Cunningham's Manual of Practical Anatomy Vols.I, II & III Oxford University Press, 15th edition (1996)	G.L.Romanes
2. Clinical Anatomy for Medical Student, 6th Edition (2000) Little, Brown & Co.	R.S. Snell

	3. Text book of Human Osteology, Jaypee Brothers, Medical Publishers.	I.B.Singh
II.	**Histology**	
	1. Histology : A text & atlas, 3rd edition (1995), Williams & Wilkins	M.H. Ross, E.& L.J Romell, G.I. Kaye
	2. Atlas of Histology with functional correlation. International Edition 9th (2000).	Di Fiore's
	3. Textbook of Human Histology (4th Edition) Jaypee Brother, 2002.	Inderbir Singh
III.	**Developmental Anatomy**	
	1. Medical Embryology, 8th Edition Williams & Wilkins	Jan Langman
IV.	**Neuroanatomy**	
	1. The Human Nervous System : An Anatomical View Point, 7th Edition, 1998. Harper & Row	Murray L Barr & Keirman
	2. Neuroanatomy : An Illustrated Color Text, 2nd Edition, 2000 Churchill Livingstone	AR Crossman and D Neary
V.	1. Surface and Radiological Anatomy, 1st Edition, 1998, CBS Publishers.	A.Halim
VI.	**Genetics**	
	1. Thomson and Thomson Genetics in Medicine, 6th Edition, 2001 W.B.Saunders Company	Robert L.Nussbaum Roderick R.Mc.Innes Huntington E.Willard

EXAMINATION PATTERN & MARKS DISTRIBUTION

Total Marks	**:**	**400**
Internal Assessment	**:**	**200**
Professional Examination	**:**	**200**

Internal Assessment : These assessments in theory and practical are held as given below :

	Theory	**Practical & Viva**	**Total**
1st Mid Semester	33	33	66
End Semester	33	33	66
IInd Mid Semester	34	34	68
Grand Total (Theory & Practical, Viva)	100	100	200

Professional Examination

Theory	Marks
Paper I (General Anatomy and Gross Anatomy of whole body)	50
Paper II (Embryology, Microanatomy, Neuroanatomy & Genetics)	50
Total (Theory)	100
Practicals (Gross Anatomy, Embryology, Histology, Neuroanatomy, Genetics)	65
Viva Voce	35
Total (Practical & Viva)	**100**
Grand Total (Theory + Practicals & Viva)	**200**

Theory Papers

Comprise of mainly Short Answer Questions (SAQs), diagrams of cross sections and important arrangement / relation of viscera, fill in the blanks etc.

Practicals

Include identification of slides, models, photographs, specimen, prossected parts, X-rays, MRI and structure in cross sections at various levels of body.

BIOCHEMISTRY

OBJECTIVES

Knowledge

At the end of the course, the student should be able to: demonstrate his knowledge and understanding on the:

1. Molecular and functional organization of a cell, and sub- cellular components;
2. Structure, function and interrelationship of biomolecules and consequences of deviation from normal;
3. Basic and clinical aspects of enzymology and regulation of enzymatic activity;
4. Digestion and assimilation of nutrients and consequences of malnutrition;
5. Integration of the various aspects of metabolism, and their regulatory pathways;
6. Biochemical basis of inherited disorders and their associated sequelae;
7. Mechanisms involved in maintenance of body fluid and pH homeostasis;
8. Molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine;
9. Molecular concepts of body defence and their application in medicine;
10. Biochemical basis of environmental health hazards; and biochemical basis of cancer and carcinogenesis, principles of metabolism, and detoxication of xenobiotics.
11. Principles of various conventional and specialized laboratory investigations and instrumentation, analysis and interpretation of a given data; the ability to suggest experiments to support theoretical concepts and clinical diagnosis.

Skills

At the end of the course, the student should be able to

1. make use of conventional techniques/ instruments to perform biochemical analysis relevant to clinical screening and diagnosis

2. analyze and interpret investigative data
3. demonstrate the skills of solving clinical problems and decision making.

COURSE CONTENT

Theory

Biological cell

(a) Architecture, compartmentation, cell membrane structure and functions; structure- function relationships.

(b) Membrane transport.

Biomolecules

(a) Function and classification of carbohydrates, lipids, protein and amino acids.

(b) Stereoisomerism and chemistry of monosaccharides, amino acids, and fatty acids.

(c) Structural organization and structure-function relationships of proteins. Hemoglobin and myoglobin, molecular mechanism of O2 transport and storage. Molecular basis of sickle cell anaemia and thallesemias.

(d) Molecular mechanism of muscle contraction.

(e) Plasma proteins, their functions and clinical significance.

Enzymes

(a) Nomenclature, classification,

(b) Kinetics, mechanism of enzymatic catalysis.

(c) Factors influencing enzymatic catalyses, enzyme activators and inhibitors.

(d) Regulation of enzyme activity,

(e) Clinical enzymology, isoenzymes.

Metabolic pathways, their regulation and metabolic interrelationships

Metabolism: general concepts and characteristics of metabolic pathways.

Carbohydrate metabolism

(a) Pathways of glucose metabolism: glycolysis

(b) HMP shunt

(c) Gluconeogenesis

(d) Glycogenolysis, glycogenesis

(e) Galactose and fructose metabolism

(f) Glycogen storage disease

(g) Inborn errors of glucose metabolism

(h) Regulation of glucose metabolism.

Amino acid metabolism

(a) General reactions, transamination, its metabolic and diagnostic significance

(b) Disposal of amino acid nitrogen and detoxication of urea

(c) Metabolic fate of amino acid carbon skeleton

(d) Sulphur containing amino acids

(e) In born errors of branched chain and aromatic amino acids

(f) Important amino acid derivatives.

Lipid metabolism

(a) Biosynthesis and degradation of fatty acids, phospolipids and triacylglycerols

(b) Biosynthesis of cholesterol, chemistry and metabolism of lipoproteins.

(c) Hyperlipoproteinemias

(d) Lipid storage disease.

(e) Ketone bodies: their synthesis, utilization and conditions leading to ketoacidosis, prostaglandin.

TCA cycle and biological oxidation, prostanoids.

Regulation of the metabolic pathways

(a) Carbohydrate, lipid and amino acid metabolism

(b) Interlinks between these pathways.

(c) Organ interrelationships in metabolism,

(d) Blood glucose regulation, and its impairment in diabetes mellitus.

(e) Metabolic adaptation in the fed state, fasting and prolonged starvation.

(f) Metabolic derangements and adaptations in diabetes mellitus.

Food assimilation and nutrition

(a) Digestive enzymes, their action on dietary carbohydrates, fats and proteins.

(b) Absorption of glucose, amino acids and lipids.

(c) Gastric, pancreatic and intestinal function tests, liver function tests.

(d) Functions of dietary ingredients, the macro and micronutrients.

(e) Fat soluble and water soluble vitamins

(f) Malnutrition

(g) Iron metabolism and heme synthesis.

Hormones

(a) Molecular basis of hormonal action, signal transduction mechanisms.

(b) Chemistry, functions and mechanism of action of hormones of the pituitary, thyroid, parathyroid, adrenals, panaceas, and gonads.

(c) Biosynthesis of steroid hormones their functions and mechanism of action.

(d) Pineal body

(e) Endorphins and encephalins,

(f) Calcium homeostasis.

(g) Hormonal interplay in the regulation of metabolism.

Molecular Biology

(a) Nucleic acids: DNA and RNA structure

(b) DNA Replication,

(c) DNA Transcription

(d) Post-transcriptional processing.

(e) Translation of genetic code

(f) Regulation of gene expression and protein synthesis inhibitors of protein synthesis.

(g) DNA repair mechanisms,

(h) Applied aspects of purine and pyrimidine metabolism

(i) Genetic Engineering: Recombinant DNA technology

(j) DNA and diagnostics

(k) DNA repair mechanisms and related disorders

(l) Telomers, telomerases

(m) Inhibitors of DNA replication, apoptosis

pH, Buffer, physiological buffer systems

(a) Regulation of blood pH, acidosis, alkalosis,

(b) Renal functions tests.

Immunology

(a) Reticuloendothelial system, components and functions of the innate and adaptive immunity.

(b) Role of T and B lymphocytes, antigen presentation

(c) Induction of immune response

(d) Cell mediated immune response

(e) Immunoglobulin structure and functions

(f) Humoral immune response

(g) Fate of antigen antibody complex,

(h) Complement system

(i) Generation of antibody diversity,

(j) Hypersensitivities

(k) Immunoregulation, autoimmunity, tolerance

(l) HLA, disease association & transplantation

(m) Immunological techniques, application in medicine (vaccines, immunotherapy, immunoassays and immunodiagnostics).

Environmental biochemistry, cancer and cancer makers

(a) Xenbiotics, interaction with biomolecules, effects, metabolism, detoxication,

(b) Biochemical characteristics of cancer

(c) Environmental pollutants and carcinogenensis.

PRACTICALS

1. Laboratory Instrumentation.
2. Protein fractionation, denaturation, separation of proteins and amino acids.
3. Colour reactions of amino acids and proteins.
4. Estimation of blood analytes: glucose, total cholesterol and HDL cholesterol, uric acid, electrolytes, urea.
5. Cerebrospinal fluid analyses.
6. Gastric juice analyses.
7. Urine analyses.
8. Amniotic fluid analyses.
9. Enzymes: amylase, lactate dehydrogenase and alkaline phosphatase
10. Liver function tests
11. Renal function tests.
12. Gel electrophoresis of DNA.
13. Immunodiffusion techniques, RIA and ELISA
14. Case-oriented discussions (enzymes, metabolites, function tests)

Biochemistry is taught in two semesters in the 1st year of the MBBS curriculum.

1st Semester : Aug-December

2nd Semester : Jan-June

TEACHING-LEARNING METHODOLOGY

1. Didatic lectures: three and a half hours/week of interactive classroom lectures to facilitate learning of terminology, principles and concepts. Books and resource material are suggested to encourage self- directed learning.
2. Tutorials; Two hours/week. Problem based small group discussions, questions-answer sessions, revision and reinforcement of difficult concepts in tutorial hours. The purpose is to inculcate skills of reasoning, meaningful approaches to learning and facilitate understanding of the subject.
3. Laboratory exercises: (Biochemistry practicals) three hours/week: a) to substantiate and clarify theoretical concepts with experimental evidence b) to develop skills of performing basic biochemical tests important in clinical investigations c) to develope familiarity with biochemical laboratory instrumentations techniques.

   (1) Practical bench work

(2) Demonstration

(3) Analyses and interpretation of data

(4) Discussions on the practicals with the help of clinical and scientific problems

TEXT-BOOKS RECOMMENDED

1. Biochemistry Ed. Lubert Stryer. W.H. Freeman and Company, New York.
2. Principles of Biochemistry. Ed. Lehinger, Nelson and Cox. CBS Publishers and distributors.
3. Harper"s Biochemistry, Ed. R.K. Murray, D.K. Granner, P.A. Mayes and V.W. Rodwell. Appleton and Lange, Stamford, Connecticut.
4. Textbook of Biochemistry with Clinical Correlations. Ed. Thomas M. Devlin, Wiley-Liss Publishers.
5. Tietz Textbook of Clinical Chemistry. Ed. Burtis and Ashwood. W.B. Saunders Company.
6. Biochemistry. Ed. Donald Voet and Judith G. Voet. John Wiley & Sons, Inc.
7. Immunology Ed. 5th Richard A. Goldsby, Thomas J Kindt, Barbara A Osborne, Janis Kuby.
8. Immunology Ed. 6th Ivan Roitt, Jonathan Brostoff, David Male.

EXAMINATION & MARKS DISTRIBUTION

Semester examinations

1st mid Semester: held on 1st – 2nd week of October

1st end Semester: held on 1st – 2nd week of December

Second Semester: held on 1st – 2nd week of March.

Semester examinations are held both for the theory and practical courses.

1st professional Final (Summative) Examination: Students are assessed on the complete 1st year syllabus in biochemistry theory and practicals.

Mark distribution

Semester examinations

Theory: total 75 (25 in each semester):

Practical: total 75 (25 in each semester)

Final Examination

Theory : Total 75

Practical : Total 75

Total marks (1st Prof. in Biochemistry)

Semester Examination	150
Final Examination	150
Total	300

Distribution of Topics

Paper I Cell structure, compartmentation, functions, biological membranes. Chemistry, functions and metabolism of amino acids, carbohydrates and lipids, metabolic interrelationships, in born errors of metabolism, nutrients and malnutrition, biological oxidation, hormones, vitamins and coenzymes.

Paper II Protein structure and functions, hemoglobin, myoglobin, plasma proteins and iron metabolism, enzymes and enzyme kinetics, nucleic acid biochemistry and molecular biology, immunology, digestion and absorption, function Tests: G.I.T., kidney, and liver, regulation of acid base balance, environmental biochemistry, cancer biochemistry.

PHYSIOLOGY

OBJECTIVES

Knowledge

At the end of the course the student will be able to:

1. explain the normal functioning of all the organ systems of the body and their interactions.
2. narrate the contribution of each organ system to the maintenance of homeostasis.
3. elucidate the physiological aspects of normal growth and development.
4. describe the physiological response and adaptations to environmental stresses.
5. list the physiological principles underlying pathogenesis and treatment of disease.

Skills

At the end of the course the student will be able to:

1. perform experiments designed either primarily for the study of physiological phenomena or for assessment of function.
2. analyse and interpret experimental/investigative data critically.
3. distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

COURSE CONTENT

Lectures

General Physiology

1. Mutual introduction of dramatis personae in the teaching learning process
2. Know thy institute
3. Physiology: what and why? Homeostasis: an evolutionary point of view

4. Characteristics of control systems
5. Looking back & forth
6. Reading efficiently

Nerve–Muscle

1. Physicochemical properties of cell membrane
2. Cell membrane: permeability & transport
3. Principles of bioelectricity
4. Genesis of resting membrane potential
5. Action potential
6. Properties of nerve-fibres
7. Functional anatomy of neuromuscular junction
8. Neuromuscular transmission
9. Muscle proteins – (Biochemistry)
10. Excitation – contraction coupling
11. Contraction kinetics of skeletal muscles
12. Smooth muscle
13. Injury & repair of nerves and muscles
14. Energetics of nerve & muscle
15. Work Physiology

Blood

1. Functions of plasma proteins
2. Principles of hemopoiesis
3. Regulation of erythropoiesis
4. Destruction of red cells: Jaundice
1. Anemia
5. Regulation of WBC production
6. Functions of WBC
7. Functions of platelets
8. Hemostasis
9. Blood groups
10. Physiological basis of transfusion medicine

Respiratory System

1. Introduction to respiratory system
2. Lung volumes and capacities

3. Mechanics of respiration – I
4. Mechanics of respiration – II
5. Composition of respired air: pulmonary ventilation
6. Exchange of gases in the lungs
7. Ventilation – perfusion ratio
8. O_2 carriage, O_2–dissociation curve
9. CO_2 carriage, CO_2–dissociation curve
10. Neural regulation of respiration
11. Chemical regulation of respiration
12. Hypoxia, cyanosis and dyspnoea
13. Special features of pulmonary circulation
14. Artificial respiration Artificial respiration
15. Therapeutic use of oxygen .

Cardiovascular System

1. Introduction to CVS
2. Properties of cardiac muscle
3. Action potential and spread of impulse in the heart
4. E-C coupling in the myocardium
5. ECG
6. Pressure changes in the heart. Cardiac cycle
7. Functional basis of heart sounds and murmurs
8. Neural regulation of cardiac activity
9. Regulation of heart rate
10. Intrinsic regulation of heart’s action. Cardiac output
11. Cardiac output: measurement and regulation
12. Nutrition and metabolism of heart
13. Exercise physiology
14. General principles of hemodynamics
15. Cardiovascular reflexes
16. Neural control of circulation
17. Special features of cerebral circulation
18. Special features of circulation in skeletal muscles and skin

Gastrointestinal System

1. Introduction to G.I. Physiology: general organization of G.I. tract
2. Mastication and deglutition

3. Gastric secretion
4. Regulation of gastric secretion
5. Pathophysiology of peptic ulcer
6. Biliary and pancreatic secretions
7. Physiology of colon
8. Pathophysiology of diarrheal disease

Nutrition

1. Introduction to nutrition. RMR
2. Carbohydrates and dietary fiber
3. Proteins
4. Fats
5. Recommended dietary allowances
6. Diet during pregnancy and lactation
7. Diet during infancy and childhood

Environmental Physiology

1. Introduction to environmental physiology
2. Body temperature regulation
3. Man in cold environment
4. Man in hot environment
5. Hypothermia and its clinical applications
6. Physiological responses to high attitude
7. Physiological responses to high atmospheric pressure

Reproduction

1. Introduction to reproductive system
2. Male reproductive physiology
3. Female reproductive physiology
4. Hypothalamic – pituitary – gonadal axis
5. Puberty
6. Pregnancy
7. Parturition and lactation
8. Reproductive ageing

Kidney

1. Renal hemodynamics and glomerular filtration
2. Renal tubular function – I

3. Renal tubular function – II
4. Regulation of renal function
5. Physiological basis of renal function tests
6. Micturition

Neurophysiology

General

1. Introduction to neurophysiology I
2. Introduction to neurophysiology II
3. CSF
4. Neuroglial cells
5. Synaptic transmission
6. Properties of synaptic transmission
7. Neurotransmitters

Sensory system

1. Coding of sensory information
2. Functional organization of ascending sensory pathways
3. Thalamus
4. Sensory cortex
5. Perception of sensory stimuli
6. Physiology of pain

Motor system

1. Characteristics and properties of reflexes
2. Functional organization of motor system – I
3. Functional organization of motor system – II
4. Brain stem reflexes, stretch reflexes and tendon reflexes
5. Basal ganglia
6. Cerebellum
7. Vestibular neck reflexes: maintenance of equilibrium
8. Localizing the level of lesion in neurological disease

Visceral and motivational system

1. Autonomic nervous system
2. Hypothalamus
3. Limbic system and emotions

EEG, sleep and higher nervous functions

1. Electroencephalography
2. Sleep and wakefulness
3. Learning and memory – I
4. Learning and memory – II
5. Speech

Special Senses

1. Functional anatomy of eye
2. Functions of retina: photoreception
3. Functions of retina: colour vision and electroretinography
4. Central mechanisms of vision and visual perception
5. Functional anatomy of ear: impedance matching
6. Organ of Corti: peripheral auditory mechanism
7. Auditory pathway
8. Central auditory mechanism and auditory perception
9. Olfaction
10. Physiology of taste

Yoga

1. Introduction to yoga
2. The yogic practices
3. Meditation: principles and practice
4. Physiological effects of yoga
5. Yoga in health and disease

Practicals

Blood

1. Preparation and examination of peripheral blood smear and determination of differential leucocyte count
2. Determination of total red blood cell count
3. Determination of total leucocyte count
4. Determination of platelet count
5. Determination of reticulocyte count
6. Determination of eosinophil count
7. Determination of osmotic fragility of erythrocytes
8. Determination of erythrocyte sedimentation rate, packed cell volume and calculation of the absolute values

9. Determination of hemoglobin concentration of blood
10. Determination of ABO and Rh blood groups
11. Determination of bleeding time, clotting time and plasma prothrombin time
12. Examination of bone marrow smear
13. Estimation of blood volume by dye dilution technique

Nerve and Muscle

1. Study of salient features of electromyography
2. Estimation of conduction velocity of human ulnar nerve and calculation of conduction velocity
3. Study of phenomenon of human fatigue : (i) Mosso's ergograph , and (ii) Handgrip dynamometer/ erograph for isometric work
4. To measure the mechanical efficiency at different grades of exercise
5. Study of excitable and contractile properties of a nerve-muscle preparation. Demonstration of (i) effect of sub-threshold, threshold, and supra-threshold stimuli, (ii) Isotonic contraction, (iii) Effect of two or more stimuli, (iv) Isometric contraction, (v) Length-tension relationship
6. Demonstration of work performed by skeletal muscle in vitro under (i)After loaded conditions, and (ii) Free loaded conditions
7. Demonstration of muscle fatigue and neuromuscular transmission in an amphibian model
8. Demonstration of compound action potential in a frog's sciatic nerve
9. Determination of strength-duration curve in frog's nerve and muscle

Cardiovascular System

1. Recording and analysis of 12 lead electrocardiogram and to measure the mean electrical axis of heart
2. Determination of the effect of posture on blood pressure
3. Determination of physical fitness of a subject using screening tests
4. Measurement of blood flow in the forearm by venous occlusion plethysmography and to demonstrate the effect of (a) Exercise, (b) Arterial occlusion, and (c) Temperature
5. Clinical examination of the human cardiovascular system (CVS)
6. Demonstration of the properties of cardiac muscle in the frog
7. Study of the factors controlling inotropic and chronotropic functions in isolated perfused frog's heart
8. Demonstration of exercise stress test

Respiration

1. Determination of various lung volumes and lung capacities and calculation of maximum voluntary ventilation (MVV) and forced expiratory volume (FEV) by spirometry
2. Recording of chest movements by a stethograph and to study the effects of Speech, swallowing, coughing, breath-holding and hyperventilation

3. Examination of human respiratory system
4. Measurement of respiratory dead space

G.I.T. and Metabolism

1. Determination of resting metabolic rate in human
2. Clinical examination of the abdomen
3. Study of the movements of isolated segment of mammalian small intestine and the effects of: (i) ions, (ii) neurotransmitters, and (iii) cold in vitro

Reproduction

1. Changes in vaginal exfoliation cytology and cervical secretion during different phases of reproductive cycles in human and in rat.
2. Pregnancy tests.
3. Determination of sperm count, motility and morphology in a human Sample

Environmental physiology

Study of the effects of exposure to hot and cold environment on human Subject

Neurophysiology

1. Examination of nervous system including cranial nerves
2. Human electroencephalography: Methods of recording and identification of different types of EEG waves.
3. Ingestive behaviour and its nervous control
4. To determine the reaction time in a human subject
5. Demonstration of non-invasive assessment of autonomic nervous functions

Special senses

1. Determination of visual acuity
2. Clinical assessment of colour vision
3. Perimetry: Mapping of visual field
4. Blind spot in the field of vision
5. Demonstration of the principles of optics in the eye using a model of eye
6. Demonstration of audiometry
7. Demonstration of vestibulo-ocular reflex (V.O.R.) by caloric stimulation

TEACHING-LEARNING METHODOLOGY

1. Lectures.
2. Tutorial and Seminars on selected topics.
3. Practical demonstrations and individual practical.

4. Audiovisual presentations (e.g. video films) on selected topics.
5. Problem based Learning on selected topics.

TEXT BOOKS RECOMMENDED

1. Understanding Medical Physiology by R.L. Bijlani
2. Review of Medical Physiology by W.F. Ganong
3. Textbook of Medical Physiology by A.C. Guyton

EXAMINATION PATTERN WITH MARKS DISTRIBUTION

Total Marks	300
Internal Assessment	150
Professional Examination	150

Internal Assessment: Three assessments in theory and practical are held as given below

			Theory	Practical &Viva
I Semester	Mid Term	50	25	25
	End Term	50	25	25
II Semester	Mid Term	50	25	25

Professional Examination

Theory	Paper I	37.5 Marks
	Paper II	37.5 Marks
Practicals		60 Marks
Viva		15 Marks

Paper I

General Physiology, Nerve-Muscle Physiology, Neurophysiology- General, sensory, Motor, Special Senses, Physiology of Yoga, Reproduction.

Paper II

Blood, Respiration, Cardiovascular Physiology, Nutrition, Gastrointestinal Physiology, Environmental Physiology, Renal Physiology.

Theory Papers: Comprise of various types of MCQs (single response, Multiple true-false, Reason-Assertion) and Short Answer Questions (SAQ)

Practicals: Objective Structured Practical Examination (OSPE).

FORENSIC MEDICINE & TOXICOLOGY

The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medicolegal responsibilities in practice of medicine. He/She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medicolegal problems. He/She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

OBJECTIVES

At the end of the course in the forensic medicine, the MBBS student will be:

1 Able to understand the basic concept of the subject and its importance.

2 Aware of inquest, legal and court procedures applicable to medico-legal and medical practice.

3 Able to perform medicolegal postmortem/autopsy findings and results of other relevant investigations for logical conclusion and framing the opinion on cause, manner and time since death.

4 Able to reserve and despatch relevant various articles, trace evidences including viscera in poisoning cases in medicolegal cases/ autopsy examination and handing over the same to appropriate agencies.

5 Able to identify the medicolegal cases, carryout medical examination in such cases and prepare medicolegal report as per the law of the land.

6 Aware of code of ethics, duties and rights of medical practitioner, duties towards patients and community, punishment on violation of code of ethics, various forms of medical negligence, duties towards his professional colleagues.

7 Able to diagnose and manage the cases of acute and chronic poisoning and can carryout medicolegal duties.

8 Aware of general principles of analytical, environmental, occupational toxicolgy including toxicovigilance and predictive toxicology.

9 Aware of latest advances in Forensic Medicine & Toxicology and their medicolegal importance.

COURSE CONTENT

A – FORENSIC MEDICNE

1. FORENSIC PATHOLOGY

Definition of Forensic Medicine, State Medicine, Legal Medicine and Medical Jurisprudence.

History of Forensic Medicine.

1. Criminal procedure code, Criminal cases, Civil cases, Definition of Inquest , Different types of inquest procedures police inquest, magistrate’s inquest. Cognizable and non cognizable offences, Different types of courts in India and their powers – Supreme court, High Court, Session Court, Magistrate’s court. Court procedures: Summons,oath, affirmation,conduct money, types of witnesses, types of examination in court. Examination in chief, Cross examination, Re- examination, court questions, Evidence – Oral, Documentary, Medical evidence, Medical Certificate, Dying dcelaration, Dying deposition, Conduct of a doctor in witness box and Examination of dead body at the scene of crime.
2. Definition of death, Types of death-Somatic/Clinical/Cellular, Molecular and Brain death including cortical death and Brainstem death, Natural and Unnatural death, Suspended animation Moment of death, Modes of death – Coma, Syncope and Asphyxia, Presumption of death and Survivorship and Sudden death.
3. Description of signs of death. Post-mortem changes after death –cooling of dead body, postmortem lividity, rigor mortis, cadaveric spasm, heat and cold stiffening, putrefaction, mummification, adipocere formation maceration and preservation of dead bodies.
4. Estimation of time since death on postmortem examination.
5. Examination of mutilated bodies or fragments, bundle of bones and exhumation.
6. Definition of postmortem examination, Different types of autopsies, aims and objectives of postmortem examination, Legal requirements to conduct postmortem examination, Procedure to conduct medicolegal postmortem examination, obscure autopsy, examination of clothing, preservation of viscera on postmortem examination for chemical analysis and other medicolegal purposes, postmortem artefacts.
7. Definition and classification of asphyxia, medico-legal interpretation of postmortem findings in asphyxial deaths.
8. Definition and types of hanging and strangulation. Description of clinical findings, causes of death, postmortem findings and medico-legal aspects of death due to hanging and strangulation. Examination and despatch of ligature material.
9. Definition, pathophysiology, clinical features, postmortem findings and medicolegal aspects of traumatic asphyxia, obstruction of nose & mouth, suffocation, sexual asphyxia.
10. Definition, types, pathophysiology, clinical features, postmortem findings and medicolegal aspects of drowning, diatom test, Gettler test.
11. Clinical features, postmortem finding and medico legal aspects of injuries due to physical agents-heat (heat-hyper-pyrexia, heat stroke, sun stroke, Heat exhaustion (Prostration), heat cramps (miner‘s cramp)),cold (hypothermia, Frostbite, trench foot, Immersion foot), lightening,electrocution and radiations.

12. Clinical features, postmortem findings and medicolegal aspects of death due to starvation and neglect. Types of injuries, clinical features, pathophysiology, postmortem findings and medicolegal aspects in cases of burns and scalds.
13. Definition of infanticide, foeticide and stillbirth. Signs of intrauterine death, Signs of live birth, viability of foetus, age determination of foetus, demonstration of ossification centres, precipitate labour, Haase's rule, Hydrostatic test, maceration, Sudden infants death syndrome, Munchausen's syndrome by proxy.

2. CLINICAL FORENSIC MEDICINE

14. Establishment of identity of living persons – Definition of Corpus Delicti,Race, sex, religion, complexion, stature, age determination using morphology, teeth-eruption,decay, bite marks, bones-ossification centres, medicolegal aspects of age. Foetal age determination, Identification of criminals,unknown persons, dead bodies from the remains-hairs,fibers,teeth,anthropometry, dactylography, foot prints,scars,tattoos,poroscopy and Superimposition.
15. Definition and classification of injuries, Various types of injuries. Abrasion, bruise, laceration, stab wound, incised wound,chop wound, defence wound, self inflicted/fabricated wounds and their medicolegal aspects.
16. Description of regional injuries to head (Scalp wounds, fracture skull, Intracranial haemorrhages, Coup and contrecoup injuries), Neck,Chest,Abdomen,Limbs,Genital organs, Spinal cord and skeleton, Vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine, reconstruction of scene of crime.
17. Definition of Injuries, Assult and Hurt. IPC pertaining to injuries. Accidental,Suicidal and Homicidal Injuries. Types of Injuries – Simple ,Grievous and Dangerous. Different types of weapons, Dangerous weapons and their examination. Antemortem and Potmortem Inuries, Medico-legal aspects of injuries. Factors influencing, Infliction of Injuries and Healing, Different legal questions, examination and certification of wounds, Wound as a cause of death: Primary and Secondary. Dowry death. Workman's Compensation Act.
18. Firearm injuries. Classification of fire-arms. Structure and components of various firearms,description of ammunition propellant charge and mechanism of fire-arms, Various terminology in relation of firearm – calibre, range,choking. Description of different types of cartridges and bullets.
19. Description of wound ballistic, blast injuries and their interpretation. Preservation and despath of trace evidences in cases of firearm and blast injuries. Various test related to confirmation of use of firearms.
20. Definition and types of sexual offences, Definition of rape. Section 376 IPC, Examination of the victim of an alleged case of rape, Examination of the accused of an alleged case of rape, preparation of report and framing the opinion in rape cases, preservation and despatch of trace evidences in cases of rape. Adultery, Unnatural Sexual offences Sodomy, Examination of accused and victim, preparation of report and framing of opinion, preservation and despath of trace evidences in cases of sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault. Sexual perversions. Fetichism, transvestism, voyeurism, sadism necrophagia, masochism, exhibitionism, frotteurism, necrophillia.
21. Definitions of Impotence, Sterility, Frigidity, Sexual Dysfunction, Premature Ejaculation, Causes of

Impotence and sterility in male and female, Sterilization, Artificial Insemination, Surrogate mother, Delhi Artificial Insemination act 1995.

22. Definition of Virginity and defloration, anatomy of male and female genitalia, Hymen and its types, Medicolegal importance of hymen, Medicolegal importance of pregnancy, diagnosis of pregnancy, Superfoetation, superfecundation, Definition of Legitimacy and its medicolegal importance, Diputed paternity and maternity, Medicolegal aspects of delievery, Signs of delievery, Signs of recent and remote delievery in living and dead.
23. Definition, Classification and complication of abortion, MTP act 1971, Methods of procuring criminal abortion, Evidences of abortion-Living and Dead,Duties of doctor in cases of abortion.
24. Battered baby syndrome.

3. MEDICAL JURISPRUNDENCE

25. Medical council of India, state medical councils- Their functions and disciplinary control. Laws in relation to medical practice, duties of medical practitioner towards the patients and society. Indian Medical Register, rights priviliges of medical practitioner, penal erasure, infamous conduct, disciplinary committee, warning notice & euthanasia.
26. Code of medical ethics, unethical practices, dichotomy, consumer protection act , Prenatal diagnostic techniques act, Human organ transplantation act, ESI act, medicolegal issues in relation to family violence, Violation of human rights, NHRC and doctors, Doctors and media, ethics related to HIV patients.
27. Malpractice- Civil, Criminal and ethical
28. Consent, kinds of consent, informed consent, negligence, vicarious liability, the doctrine of res Ipsa Loquitor, Contributory Negligence, Therapeutic Privilige, Rules of Consent, Malingering, Therapeutic Misadventure, corporate negligence, Professional negligence, Professional Secrecy, Human Experimentation, IPC related to medical Practice, Products liability, Medical Indemnity Insurance, Medical records.

4. FORENSIC PSYCHIATRY

29. Definition, Various types of mental disorder, Lucid interval, Classification of mental disorder, mental subnormality, Diagnosis of Insanity and Feigned insanity, Restraint, admission and discharge of Insane in accordance to Mental Health act 1994, Mental disorder and responsibility-Civil and Criminal responsibility, Testamentary Capacity, Mc Naughten‘s rule.

5. FORENSIC SCIENCES

30. Definition of DNAfingerprinting,Techniques of DNA Fingerprinting, Application of DNA profiling in forensic Medicine, HLA typing.
31. Locard’s exchange principle, Examination, preservation, despatch and identification of blood, Seminal stains (Physical,microscopic,chemical and serological test, blood grouping) and its medicolegal aspects, Saliva, vaginal fluid, faecal and urinary stain, examination of skin, nail tooth pulp and other body fluids group specific substances, hazards of blood transfusion.

B. TOXICOLOGY

1. GENERAL TOXICOLOGY

History of Toxicology, Definition of Toxicology, Forensic Toxicology, Clinical toxicology and Poison, Laws in relation to poisons, Medicolegal aspects of poisons, Classification of poisons, Toxicokinetics and Toxicodynamics, diagnosis of poisoning in living and dead, General principles of management of poisoning, Antidotes and its types, Medicolegal autopsy in cases of poisoning, preservation and despatch of viscera for chemical analysis.

2. CLINICAL TOXICOLOGY

Types of poison, Clinical signs and Symptoms, diagnosis, management and medicolegal aspects of :

1. Corrosive poisons – sulphuric acid, phenol ,oxalic acid, nitric acid, hydrochloric acid, organic acids and alkalies.
2. Irritant non metallic poisons- Phosphorus, Halogens, Organophosphorus, chlorinated hydrocarbons, miscellaneous preparation & mechanical irritatants.
3. Agricultural poisons- Organophosphorous, Organochlorine. Classification and description of common insecticides and pesticides used in India
4. Metallic poison - arsenic, lead, iron, copper, zinc, thallium.
5. Animal poisons – snake bite, scorpion bite , wasp, bee, cantherides & toxic fishes.
6. Somniferous poisons – opium & its derivatives, synthetic preparations, pethidine & codeine.
7. Deliriant poisons – Dhatura , hemlock, cannabis, LSD, muscaline & cocaine .
8. Spinal & peripheral nerve poisons – strychnine, curare & domestic poisons – kerosene, cleansing agents, disinfectants, household medicines.
9. Barbiturate poisoning, drug abuse & common drug overdoses.
10. Vegetable poisons – abrus, ricinus, croton, ergot, capsicum, camphor, argemone, lathyrus & calotropis.
11. Describe and examine Alcohol poisoning (ethyl & methyl alcohol) and drunkenness, its medico-legal aspects & benzodiazepine poisoning.
12. Cardiac poisons – HCN, aconite, tobacco, quinine, digitalis and oleander.
13. Asphyxiant poisons – carbon monoxide, , carbon dioxide, hydrogen sulphide, phosgene and phosphine.
14. Definition of food adulteration. Names of common adulterants and general methods of detection for food adulterants, Common food poisonings- Botulism, Chemical Poisoning, Poisonous Mushrooms and epidemic dropsy.

3. ENVIRONMENTAL TOXICOLOGY

15. Description of toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry.
16. Description and medico-legal aspects of poisoning in Workman’s Compensation Act.

4. ANALYTICAL TOXICOLOGY

17. General principles of analytical toxicology and its application in management , prevention and control

of poisoning.

18. Basic principles of functioning of Gas Liquid Chromatography, Thin Layer Chromatography, Atomic Absorption Spectrophotometer, Spectrophotometer, Neutron Activation Analysis, Mass spectrometry, alcometer.

PRACTICALS IN FORENSIC MEDICINE & TOXICOLOGY

1. Preparation of a Medico-legal report of an injured person due to mechanical violence.
2. Preservation and despatch of the exhibits in a suspected case of poisoning.
3. Estimation age of a person for medico-legal and other purposes.
4. Conduct & prepare postmortem examination report in a case of suspected poisoning and to preserve & dispatch viscera for chemical analysis.
5. Conduct & prepare postmortem report in a case of death due to violence of any nature - road accident, fall from height, assault, factory accident, electrocution, burns & accident due to any other cause, fire arm injury, asphyxia, natural death & medical negligence. At least 10 postmortem reports should have been written by the student.
6. Demonstration, interpretation and medico-legal aspects from examination of hair (human &animal)fibre, semen & other biological fluids.
7. Demonstration & identification of a particular stain is a blood and identification of its species origin.
8. Identification ABO & RH blood groups of a person.
9. Examination & drawing opinion from examination of skeletal remains.
10. Identification & drawing medico-legal inference from various specimen of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of a bone .
11. Identification & description of weapons of of medicolegal importance commonly used e.g. lathi, knife, kripan, axe, gandasa, gupti, farsha, dagger, bhalla, razor & stick
12. Description of the contents and structure of bullet & cartridges used & medico-legal interpretation drawn.
13. Estimation of age of foetus by postmortem examination.
14. Examination & preparation of report of an alleged accused in a rape/unnatural sexual offence.
15. Examination & preparation medico-legal report of a victim of sexual offence/unnatural sexual offence.
16. Examination and preparation of medico-legal report of a drunk person.
17. Demonstration of the common instrument used in analysis of poision & DNA profile – TLC,GLC,AAS.
18. Identification & drawing of medico-legal inference from common poisons e.g. Dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, snakes, capsium, calotropis, lead compounds & tobacco.
19. Examination & preparation of a medico-legal report of a person brought for medical examination in cases pertaining to police, judicial custody or referred by court of law and violation of human rights as requirement of NHRC.
20. Identification & drawing of medico-legal inference from histopthological slides of Myocardial infarction pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain hemorrhage, bone fracture,

pulmonary odema, brain odema, soot particles, diatoms & wound healing.

METHODOLOGY OF TEACHING

1. Lectures/Demonstration
2. Tutorials/Seminars

LECTURES

IIIRD SEMESTER: July - December

Classes begin after 15th August

Total hrs (Lectures) about – 10

IVTH SEMESTER: Jan. – June

Total lectures about – 30

VTH SEMESTER: July – December

Total lectures about 15.

SUGGESTED TEXTBOOKS

1. Dr.K.S.N.Reddy- The essential of Forensic Medicine & Toxicology 21st Edition 2002. Published by- K.Saguna Devi, H,No. 16-11-15/2/2, Saleem nagar Colony, No.1, malapet, Hyderabad-500036.
2. Modi's Textbook of Medical Jurisprundence and toxicology- Edited by BV Subramanyam, Butterworths India, New Delhi.22nd edition, 2001.
3. Dr. C.K.Parikh- A text book of Medical Jurisprundence, Forensic Medicine & Toxicology, CBS Publishers, Delhi, Sixth Edition 1999.
4. Dr. Apurba Nandy- Principles of Forensic Medicine, 3rd Edition 2000, New Central Book Agency (P) ltd. Calcutta.
5. Dr. Krishan Vij- Text book of Forensic Medicine & Toxicology- Principles and Practice, BI Churchill Livingston, New Delhi, 2nd edition, 2002.

EXAMINATION SCHEDULE AND DISTRIBUTION OF MARKS

Total Marks	-	150
Theory	-	75
Practical	-	75
Internal assessment Theory	-	37
Internal assessment Practical	-	38

For Internal assessment examination is held three times ordinarily in following dates-

a)	IVth Mid-semester Exam.	-	6th March to 16th March
b)	IVth End-semester Exam.	-	Ist Week of May – 15th May
c)	Vth End-semester Exam.	-	Ist Nov. – 15th Nov.

Marks distribution for semester exam -

		Theory	Practical
a)	IVth Mid semester exam.	12	13
b)	IVth End semester exam.	13	12
c)	Vth End semester Exam.	12	13

Marks distribution for IInd Professional Final Exam.

Total	Theory	Practical
75	38	37

Theory paper consists of two parts -

a) Forensic Medicine 19 marks

b) Toxicology 19 marks

Both above two papers have to be answered on separate sheets.

MICROBIOLOGY

The goal of teaching microbiology to undergraduate medical student is to provide an understanding of the infectious disease in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections.

OBJECTIVES

(A) Knowledge

At the end of the course, the student shall be able to:

1. state the infective micro-organisms of the human body and describe the host parasite relationship
2. list pathogenic micro-organisms and describe the pathogenesis of the diseases produced by them
3. state or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources, including insect vectors responsible for transmission of infection
4. describe the mechanisms of immunity to infection
5. acquire knowledge on suitable antimicrobial agents for treatment of infection and scope of immunotherapy and different vaccine available for prevention of communicable diseases
6. apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections
7. recommend laboratory investigations regarding bacteriological examination of food, water, milk and air

(B) Skills

At the end of the course, the student shall be able to :

1. plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agents
2. identify the common infectious agents with the help of laboratory procedures and use antimicrobial sensitivity tests to select suitable antimicrobial agents

3. use the correct method of collection, storage and transport of clinical material for microbiological investigations

COURSE CONTENT

III SEMESTER

1. **Introduction to Microbiology**
   - (i) Natural history of microbial diseases.
   - (ii) Unique differentiating features of eukaryotes and prokaryotes
   - (iii) Source and spread of microbes
   - (iv) Rationale for classifying microbes into bacteria, fungi viruses, parasites.
2. **Introduction to Bacteriology**
   - The nature of bacteria
   - Morphological differences
   - Growth requirement
   - Nomenclature and classification
   - Enumeration of bacteria responsible for certain primary diseases.
3. **Bacterial Staining and Cultivation**
   - Microscopy : types and principles
   - Staining : principles
   - Media for growth / bacterial colony
   - Familiarization with materials used
4. **Common Tests for Bacterial identification**
   - Various types of staining such as simple, differential staining; different procedures of staining and their principles
   - Motility testing
   - Common sugar fermentation and other biochemical tests such as Catalase / Coagulase/ citrate utilization/ nitrate reduction / urease/ PPA/ OF/ Indole etc.
   - Sensitivity testing
5. **Introduction to parasitology**
   - Biology of protozoa
   - Protozoan parasites causing human infection
   - Medically important helminths
   - Ectoparasites
6. **Introduction to Virology**
   - The nature and properties of viruses
   - Classification of viruses

– Morphology

7. **Laboratory Diagnosis of Viral Infection**
   – Brief appraisal of pathogenicity of viruses
   – Culture methods
   – Cytopathic effects
   – Inclusion bodies
   – Animal inoculation
   – Serological test (CFT, HAI, neutralisation)

8. **Introduction to Mycology**
   – Nature of fungi : basic structures and classification
   – Superficial mycoses
   – Subcutaneous mycosis
   – Systemic fungal infections with opportunistic mycosis

9. **Common Laboratory Methods for Diagnosis of Fungal Infections**
   (i) KOH preparation with principles
   (ii) Lactophenal cotton blue preparation
   (iii) Negative staining and procedures
   (iv) Special staining and procedures
   (v) Culture of fungi
   (vi) Serodiagnosis

10. **Collection of Transport of Samples**
   – Collection of clinical samples
   – Transport of various appropriate clinical samples.
   – Transport media
   – Description of container with contents or no contents.
   – Preliminary processing of clinical samples

11. **Host-Parasite relationship**
   – Presence of normal flora
   – Enumeration and explanation of various host-parasite interaction
   – Mechanism of pathogenesis adhesion/ colonisation/ virulence and toxigenicity
   – Host response
   – Koch's postulates

12. **Bacterial AND Viral Genetics**
   – Structure and replication of bacterial DNA
   – Plasmids
   – Transfer of genetic materials

- Mutations
- Viral replication
- Interactions among viruses (recombination, genetic reactivation, complementation etc).
- Epidemiology of viral infection
- Recombinant DNA technology

13. **Immunity to infection**
    - Normal immune system
    - Innate Immunity
    - Antigens – presentation and association in immunity
    - Immunoglobulins and their role in immunity
    - Cell mediated immunity and their role
    - Hypersensitivity
    - Immunodeficiency
    - Tolerance
14. **Immunodiagnosis**
    - Antigen-antibody reactions in infectious diseases and diagnostic tests based on these
15. **Vaccines**
16. **Sterilisation and disinfection**
    - Principles
    - Various methods
    - Demonstration of equipments and agents used in sterilization
    - Visit to CSSD
17. **Bacteriology of water and air**

Infections of Gastrointestinal Tract

18. **Microorganisms associated with**
    gastrointestinal infections.
    (Bacteria, parasites, viruses and fungi).
19. **Gastrointestinal infections caused by parasites**

    19a. Amoebiasis
    - Entamoeba spp
    - Naegleria spp
    - Acanthamoeba spp

    19b. Amoebiasis (Micro, Gastro, Surg, Paeds)

    19c. Other intestinal protozoal infections
    (Micro, Gastro, Paeds)

(To be continued in IV Semester)

PRACTICAL SCHEDULE FOR III SEMESTER

1. **Microscopy and micrometry**
   - Introduction to microscopes
   - Focussing slides under low/ high power and oil immersion
   - Principles and demonstration of various types of microscopes
2. **Direct demonstration of bacteria by staining**
   - Gram staining
   - Albert's staining
   - Acid fast staining
3. **Motility tests and biochemical tests for bacterial identification**
   - Hanging drop method for motility testing
   - Important biochemical tests : principles and interpretation
4. **Laboratory diagnosis of viral infections**
   - Collection and transport of samples
   - Demonstration of egg inoculation techniques, cell culture, cytopathic effect, plaque assay, serological tests (complement fixation, haemagglutination inhibition, neutralization, ELISA)
5. **Laboratory diagnosis of fungal infections**
   - Collection and transport of specimens
   - Gram stain, KOH preparation, India ink preparation for direct demonstration
   - Sabouraud's dextrose agar/media
   - Lactophenol cotton blue for identification
   - Latex agglutination test
6. **Sterilization and disinfection**
   - Visit to media and sterilization room (demonstration of autoclave and hot air oven)
   - Visit to CSSD
7. **Stool examination for cysts**
   - Collection and transport of stool sample for parasites
   - Direct examination (saline and iodine preparations)
   - Concentration of stool for parasites
   - Identification of cysts

III SEMESTER - SCHEDULE BREAK-UP

Didactic lectures (DL) : 16	16 hours
Intra-departmental seminars (IDS) : 3	6 hours
Integrated seminars (IS) : 2	4 hours

Practical sessions : 7 14 hours
TOTAL : 40 hours (16 one hour sessions and 12 two hour sessions)

IV SEMESTER

Infections of gastrointestinal tract (contd.)

1.	Intestinal nematodes	(Classification, epidemiology, life cycles etc.)	
2.	Intestinal nematodes	(Clinical features and lab diagnosis)	(Micro, Gastro)
	Intestinal cestodes and trematodes	(Focus: only those seen in india; incl. cysticercosis)	
3.	Intestinal cestodes	(Epidemiology, clinical features, microbiological aspects, diagnosis)	(Micro, Gastro, Neuro)
4.	Enterobacteriaceae	(Introduction, common features, classification, infections caused - enumeration only)	
5.	Bacterial diarrhoea and dysentery	(Focus: e.coli and shigella)	(micro, gastro, paeds)
6.	Cholera	(Bacteriology, virulence, toxins, pathogenesis)	
7.	Cholera	(Clinical Features, Epidemiology, lab diagnosis, vaccines)	(Micro, Med, Paeds, Comm. Med)
8.	Food Borne Pathogens		(Micro, Med, Paeds)
9.	Bacterial food poisoning	(Aetiology, toxins, types, etc. include: introduction to staphylococcus and salmonella)	
10.	Helicobacter pylori	(PLUS: 1 I.S. should be taken by clinical department)	
11.	Viral gastroenteritis	(To be accomodated by paediatrics involving microbiologists IN I.S.)	
13.	Tutorial :	Infections of the G.I.T.	

Infections of liver & lymphatics

14. Viral hepatitis
    - 14a. (Hepatitis A, B)
    - 14b. (Hepatitis C, D, E)
15. Echinococcus Granulosus Infection
16 Filariasis (and brief introduction to other tissue nematodes)

Infections of the respiratory tract

17. Streptococcal infections	(Group A, B, B: bacteriology, pathogenesis, infections, lab diagnosis), and, introduction to viridans group and pneumococcus	
18. Sequelae of streptococcal infection		
19. Diphtheria	(Bacteriology/ pathogenesis/ lab diagnosis)	
20. Diphtheria, whooping cough and acute viral respiratory infections of childhood		
21. Agents causing pneumonia	(bacterial :incl. gnb, pneumococcus mycoplasma, chlamydia, legionella; viral; pneumocystis)	
22. Mycobacteria with special reference to Mycobacterium tuberculosis		
23. Infections due to Non-tubercular Mycobacteria (NTM) and Mycobacterium leprae		
24. Tuberculosis		BY Clinical Department (to include Microbiology)

25. **Tutorial: infections of respiratory tract**

Urinary tract infection

26. Urinary tract infections		(Micro, Paeds, Med)

Wound infections/anaerobic infections/fungal infections

27. Staphylococcal infections -	including bacteriology, pathogenesis and lab diagnosis	
28. Anaerobic infections of clinical importance GNB anaerobes Clostridia		
29. Laboratory diagnosis of wound infections		(Micro, Surgery, Obs & Gynae)
30. Dermatophytosis		(Micro, Dermatol)
31. Mycetoma & subcutaneous mycosis		(Micro, Dermatol)
32. Systemic mycoses		(Micro, Path)

Infections of the eyes

33. Eye Infections — by Department of Microbiology (RPC)

34. Tutorial

PRACTICAL SCHEDULE FOR IV SEMESTER

1. **Stool examination for intestinal nematodes and cestodes**
   - Collection/transport and concentration of sample
   - Identification of ova of intestinal nematodes and cestodes
   - Identification of adult worms and larvae
2. **Enterobacteriaceae**
   - Common media and biochemical tests
   - Culture characteristics of members of Enterobacteriaceae
3. **Laboratory diagnosis of E.coli infection and shigellosis**
   - Stool examination for pus cells and RBCs
   - Processing of stool specimen for bacterial culture
   - Cultural characteristics, tests for E.coli and its virulence factors
   - Cultural characteristics of Shigella and its identification (incl. slide agglutination test)
4. **Laboratory diagnosis of cholera**
   - Collection and transport of specimen
   - Culture media and characteristics
   - Identification (incl. motility, oxidase and other tests)
   - Biotyping and serotyping
5. **Laboratory diagnosis of food poisoning**
   - Focus on: laboratory diagnosis of salmonellosis
   - Demonstration for Clostridium perfringens and others
6. **Laboratory diagnosis of filariasis**
   - direct examination/staining for microfilaria
   - demonstration of other aspects of filariasis - including vector
   - include revision of stool examination for helminthic ova
   - include demonstration of hydatid cyst
7. **Laboratory diagnosis of upper respiratory infections**
   - Focus on: laboratory diagnosis of Streptococcus infection
   - Albert's stain
   - Media, identification and toxin of Corynebacterium (demonstration)
8. **Laboratory diagnosis of lower respiratory tract infections**
   - Focus on: Klebsiella and Streptococcus pneumoniae

— Viral respiratory infection (demonstration of diagnostic methods)

9. **Laboratory diagnosis of tuberculosis**
   - Collection of specimens (focus: sputum)
   - Concentration methods
   - Acid fast staining
   - LJ medium and culture characteristics
   - Differentiation between Mtb and NTM (basic concept/demonstration)
10. **Laboratory diagnosis of UTI**
    - Collection, storage and transport of urine
    - Significant bacteriuria and quantitative/semiquantitative methods of culture
    - Media: including CLED
    - E.coli/ Klebsiella (revision)
    - Focus on: Identification of Proteus and Pseudomonas - cultural characteristics like swarming, pigment production; and tests like OF and oxidase
11. **Laboratory diagnosis of wound infections**
    - Focus on: Staphylococcus (culture/ identification including tests like catalase and coagulase)
12. **Laboratory diagnosis of anaerobic infections**
    - Demonstration of collection of samples for anaerobic culture
    - Methods of anaerobiasis - RCMB, anaerobic jar
    - Demonstration of media and culture for Clostridium, smears showing sporing and non-sporing GPB, Nagler's reaction etc. and cultures of GN anaerobes like B.melaninogenicus
13. **Laboratory diagnosis of superficial, subcutaneous and deep mycoses**

IV SEMESTER - SCHEDULE BREAK-UP

Didactic lectures (DL) : 17	17 hours
Intra-departmental seminars (IDS) : 1	2 hours
Integrated seminars (IS) : 13	26 hours
Tutorials : 3	3 hours
Practical sessions : 13	26 hours

TOTAL : 74 hours (20 one hour sessions and 27 two hour sessions)

V SEMESTER

Pyrexia of Unknown origin AND OTHER FEBRILE ILLNESSES

1. (1A. and 1B.) Enteric fever	In clinical semesters (incl. Micro)
2. Malaria	
2a. (Transmission, species, life cycle and stages)	(Micro, med, Paeds,
2b. (Clinical features, lab diagnosis, prevention etc.)	Community Med)

3. (3a. and 3b.) Leishmaniasis	(Micro, Dermatol, Med)
4. Childhood Viral ExAnthema	(Micro, Paeds)
5. Viral haemorrhagic fever	
6. Rickettsial infection with special reference to Indian rickettsial infection (Indian tick typhus, murine typhus, endemic typhus, scrub typhus	
7. Spirochetal infections other than Treponema pallidium (Borrelia, Leptospira)	
8. Septicaemia / Bacteraemia	In clinical semesters (incl. Micro)
9. Tutorial: P.U.O.	
Central Nervous system Infections	
10. Meningitis	(Etiology, Lab diagnosis Pathogenesis)
11. Encephalitis	(Micro, Med, Paed, Neuro)
12. Poliomyelitis	By Paeds / Community Medicine, (Incl. microbiology)
13. Rabies	(Micro, Comm. Med.)
14. Cysticercosis and other CNS Parasitic diseases	by Neurology (INCL. microbiology)
15. Slow viruses and prions	
16. Tutorial : CNS infections	
Sexually Transmitted Diseases	
17. Syphilis	
18. STD (incl. bacteriology of neisseria gonorrhoeae and other organisms)	
19. STD (clinical features and lab diagnosis)	(Micro, Derma, Obs & Gyn)
20. Herpes viruses	
Herpes viruses – Part 1	
Herpes viruses – Part 2	
21. Human Immunodeficiency virus	(Micro, Med, Paeds, Comm Med)
Congenital infections	
22. Congenital infections	(Micro, Paeds, Obs & Gyn)
23. Tutorial: Congenital infections and std	
Miscellaneous	
24. Hospital infection, universal precautions and waste management	(Micro, surgery, paeds, ICU, Hosp Admn)
25. Zoonoses (Bacterial, viral, parasitic, fungal)	
26. Entomology of medical importance	

PRACTICAL SCHEDULE FOR V SEMESTER

1. **Laboratory diagnosis of malaria**
   - Preparation, staining and examination of peripheral blood smear for malarial parasite
   - Identification of various species and stages
   - Thick smear
   - Demonstration of vector and newer methods
2. **Laboratory diagnosis of leishmaniasis**
   - Sample collection
   - Demonstration of LD bodies
   - Demonstration of vector, culture methods and serological tests
   - Revision of peripheral blood smear examination
3. **Laboratory diagnosis of enteric fever**
   - Sample collection methods and transport
   - Blood culture (in detail)
   - Stool and urine culture for Salmonella
   - Widal test
   - Identification tests and slide agglutination for Salmonella
4. **Laboratory diagnosis of meningitis**
   - Collection, aliquoting and transport of CSF
   - Other useful specimens
   - Direct smear examination
   - Culture media, growth characteristics and identification tests (focus: Neisseria, Haemophilus and Streptococcus pneumoniae)
   - Chronic meningitis: pathogens (demonstration e.g. India ink for Cryptococcus)
   - Antigen detection
5. **Laboratory diagnosis of STD**
   - Collection and transport of specimens
   - Direct demonstration
   - Serological tests (focus: syphilis, HIV)
6. **Entomology**
   - Demonstration of medically important entomological specimens

V SEMESTER - SCHEDULE BREAK-UP

Didactic lectures (DL) : 12	12 hours
Intra-departmental seminars (IDS) : 4	8 hours

Integrated seminars (IS) : 10	20 hours
Tutorials : 3	3 hours
Practical sessions : 6	12 hours

TOTAL : 55 hours (15 one hour sessions and 20 two hour sessions)

TEACHING AND LEARNING METHODOLOGY

Theory

Teaching microbiology to undergraduate medical student is provided with the help of Didactic Lectures, Intradepartmental Seminars (IS), Integrated Seminars and Tutorials that deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections.

Practicals

8. Microscopy and micrometry
9. Direct demonstration of bacteria by staining
10. Motility tests and biochemical tests for bacterial identification
11. Laboratory diagnosis of viral infections
5. Laboratory diagnosis of fungal infections
12. Sterilization and disinfection
13. Stool examination for cysts, intestinal nematodes and cestodes
14. Laboratory diagnosis of E.coli infection,shigellosis and cholera
15. Laboratory diagnosis of food poisoning
16. Laboratory diagnosis of filariasis
17. Laboratory diagnosis of upper and lower respiratory tract infections
18. Laboratory diagnosis of tuberculosis
19. Laboratory diagnosis of UTI
20. Laboratory diagnosis of wound infections
12. Laboratory diagnosis of anaerobic infections
13. Laboratory diagnosis of superficial, subcutaneous and deep mycoses
14. Laboratory diagnosis of malaria
15. Laboratory diagnosis of leishmaniasis
16. Laboratory diagnosis of enteric fever
17. Laboratory diagnosis of meningitis
18. Laboratory diagnosis of STD
19. Entomology : Demonstration of medically important entomological specimens

TEXT BOOKS RECOMMENDED

1. Medical Microbiology	Greenwood Slack, Peutherer
2. Jawetz, Melnick and Adelberg's Medical Microbiology	Geo F. Brooks, Stephen A. Morse, Janet S. Butel
3. Parasitology (Protozoology and Helminthology)	K.D. Chatterjee

EXAMINATION PATTERN WITH MARKS DISTRIBUTION

Total Marks : 200

Internal Assesment : 100

Professional Examination : 100

Internal Assessment : Five assessments in theory and practical are held as given below

		Theory+Viva	Practical
III Semester	Mid Term	10	10
	End Term	10	10
IV Semester	Mid Term	10	10
	End Term	10	10
V Semester	End Term	10	10
	Total	50	50

Professional Examination

Paper I (General Microbiology) : 25 Marks

PaperII (Systemic Microbiology) : 25 Marks

Practical Examination : 50 Marks

Theory Papers: Question paper is comprised of various types of MCQ (Single response, Multiple true-false, Matching, Reason Assertion, Multiple Completion) and short Answer Questions (SAQ).

Practical: Practical examination include spotting, different bacterial staining procedures, identification of bacterial strains using conventional methods.

PATHOLOGY

OBJECTIVES

A MBBS student at the end of training in Pathology will be able to:

1. Understand the concepts of cell injury and changes produced thereby in different tissues and organs and the body's capacity for healing.
2. Understand the normal homeostatic mechanisms, the derangements of these mechanism and the effects on human systems.
3. Understand the etiopathogenesis, the pathological effects and the clinico-pathological correlation of common infectious and non-infectious diseases.
4. Understand the concept of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
5. Correlate normal and altered morphology (gross and microscopic) of different organ systems in different diseases to the extent needed for understanding of disease processes and their clinical significance.
6. Have a knowledge of common immunological disorders and their resultant effects on the human body.
7. Have an understanding of the common haematological disorders and the investigations necessary to diagnose them and determine their prognosis.
8. Perform and interpret in a proper manner the basic clinico-pathological procedures.
9. Know the principles of collection, handling and dispatch of clinical samples from patients in a proper manner.

COURSE CONTENTS

(A) General Pathology

1. **Introduction to Pathology**

2. **Cell Injury**
   a) Cell injury: Causes and Mechanism: Ischemic, Toxic.
   b) Reversible cell injury : Types, morphology: Swelling, vacuolation, hyaline, fatty change.
   c) Irreversible cell injury : Types of Necrosis
3. **Amyloidosis and Calcification**
   a) Calcification : Dystrophic and Metastatic
   b) Amyloidosis : classification, Pathogenesis, Morphology
4. **Inflammation and Repair**
   a) Acute inflammation : Features, causes, vascular and cellular events.
   b) Morphologic variants of acute inflammation
   c) Inflammatory cells and Mediators
   d) Chronic inflammation : Causes, types, nonspecific and Granulomatous with examples
   e) Wound healing by primary and secondary union, factors promoting and delaying the process
   f) Healing at specific sites including bone healing
5. **Circulatory Disturbances**
   a) Edema : Pathogenesis and types
   b) Chronic venous congestion : Pathogenesis and changes in Lung, Liver, Spleen
   c) Thrombosis and Embolism : Formation, Fate and Effects
   d) Infarction : Types, common sites, Gangrene
   e) Shock : Pathogenesis, Types, Morphologic changes
   f) Derangements of Fluid and electrolyte imbalance
6. **Growth Disturbances and Neoplasia**
   a) Atrophy, Hypertrophy, Hyperplasia, Hypoplasia, Metaplasia, Malformation, Agenesis, Dysplasia
   b) Neoplasia : Classification, Histogenesis, Biologic Behaviour : Benign and Malignant; Carcinoma and Sarcoma
   c) Malignant Neoplasia : Grades and Stages, Local and distant spread
   d) Carcinogenesis : Environmental carcinogens, chemical, viral, occupational, Heredity and cellular oncogenes
   e) Tumour and Host Interactions : Systemic effects including paraneoplastic syndromes, Tumor immunology
   f) Laboratory diagnosis : Cytology, Biopsy, Tumor markers
7. **Immunopathology**
   a) Immune system : organisation, cells, antibodies and regulation of immune responses.
   b) Hypersensitivity : types and examples, Antibody and cell mediated tissue injury with examples.
   c) Primary immunodeficiency
   d) Secondary Immunodeficiency including HIV Infection

e) Auto-immune disorders like systemic lupus erythematosis; organ specific and non-organ specific such as polyarteritis nodosa, Hashimoto's disease.

f) Tumor Immunity

g) Organ transplantation : Immunologic basis of Rejection and Graft versus host reaction

8. **Infectious Diseases**

a) Mycobacterial Diseases : Tuberculosis and Leprosy

b) Bacterial diseases : Pyogenic, Typhoid, Diphtheria, Gram negative infection, Bacillary dysentery, Syphilis

c) Viral : Polio, Herpes, Rabies, Measles; Rickettsial, Chlamydial infection

d) Fungal diseases and opportunistic infections

e) Parasitic Diseases : Malaria, Filaria, Amebiasis, Kala-azar, Cysticercosis, Hydatid

f) AIDS : Aetiology, modes of transmission, diagnostic procedures and handling of infected material and health education.

9. **Miscellaneous Disorders**

a) Autosomal and sex-linked disorders with examples

b) Metabolic disorders

c) Protein energy malnutrition and vitamin deficiency disorders

d) Radiation Injury

e) Disorders of Pigment and Mineral metabolism such as bilirubin, melanin, hemosiderin

(B) Systemic Pathology

1. **Cardiovascular Pathology**

a) Rheumatic fever and Rheumatic Heart Disease : Pathogenesis, Morphology and effects

b) Infective Endocarditis : Causes, Pathogenesis and Morphology

c) Atherosclerosis and Ischemic Heart Disease; Myocardial Infarction

d) Diseases of blood vessels other than atherosclerosis

e) Hypertension and Hypertensive Heart Disease

f) Congenital Heart Disease : ASD, VSD, Fallot's Bicuspid aortic valve, PDA

g) Pericarditis and other pericardial diseases

h) Cardiomyopathy

2. **Respiratory Pathology**

a) Structure of Bronchial tree and alveolar walls, normal and altered lung function; concept of obstructive and restrictive lung disorders

b) Inflammatory diseases of bronchi : chronic bronchitis, bronchial asthma, bronchiectasis, chronic obstructive lung disease

c) Pneumonias : Lobar, Broncho, Interstitial

d) Pulmonary suppuration including lung abscess : Etiopathogenesis and Morphology

e) Pulmonary Tuberculosis : Primary and Secondary, Morphologic types including pleuritis

f) Emphysema : Types, pathogenesis

g) Atelectasis and Hyaline Membrane Disease

h) Tumors : Benign; Carcinoid, Malignant; Squamous cell, Oat cell, Adeno, etiopathogenesis.

i) Occupational lung disorders : anthracosis, silicosis, asbestosis, mesothelioma

3. **Urinary Tract Pathology**

a) Renal structure, basis of impaired function, urine analysis

b) Glomerulonephritis : Classification, Primary Proliferative and Non Proliferative

c) Secondary Glomerulonephritis : SLE, Purpura, Polyarteritis, Amyloidosis, Diabetes

d) Nephrotic Syndrome

e) Acute Renal Failure : Acute tubular and cortical necrosis

f) Progressive renal failure and end stage renal disease

g) Pyelonephritis, Reflux Nephropathy, Interstitial Nephritis

h) Renal tumors : Renal cell carcinoma, Nephroblastoma

i) Renal vascular disorders, kidney changes in Hypertension

j) Urinary bladder : cystitis, carcinoma

k) Urinary Tract Tuberculosis

l) Urolithiasis and Obstructive Uropathy

m) Renal Malformations : Polycystic kidneys

4. **Pathology of the Gastro-Intestinal Tract**

a) Oral Pathology : Leukoplakia; Carcinoma oral Cavity and Esophagus

b) Salivary gland tumors : Mixed, Adenoid cystic, warthin's

c) Peptic ulcer : etiopathogenesis and complications; gastritis: types

d) Tumors of stomach : Benign; Polyp, Leiomyoma, Malignant; Adenocarcinoma, Lymphoma

e) Inflammatory diseases of small intestine : Typhoid, Tuberculosis, Crohn's, Appendictis

f) Inflammatory diseases of appendix and large intestine : Amoebic colitis, Bacillary dysentery, Ulcerative Colitis

g) Ischemic and Pseudomembranous enterocolitis, diverticulosis

h) Malabsorption : Celiac disease, Trophical sprue and other causes

i) Tumours and Tumor like condition of the large and small intestine : Polyps, Carcinoid, Carcinoma, Lymphoma

j) Pancreatitis

k) Pancreatic tumors : Endocrine, Exocrine and periampullary

5. **Hematopathology**

a) Constituents of blood and bone marrow, Regulation of hematopoiesis

b) Anaemia : classification and clinical features; clinical and lab. approach to diagnosis

c) Nutritional anaemias : Iron deficiency anaemia, Folic Acid/Vit B 12 deficiency anaemia including pernicious anaemia

d) Hemolytic Anaemias : Classification and invesgiation

e) Hereditary hemolytic anaemias : Thalassemia, sickle cell anaemia

f) Hereditary hemolytic anaemias : hereditary spherocytosis, G-6-PD deficiency

g) Acquired hemolytic anaemias

h) Hemolytic Anaemias : Autoimmune, Alloimmune, Drug induced Microangiopathic and Malaria

i) Aplastic Anaemia, PNH and Myelodysplastic syndrome

j) Hemostatic disorders : Platelet deficiency; ITP, Drug induced, secondary

k) Coagulopathies : Coagulation factor deficiency; hemophilia, DIC and anticoagulant control

l) Leukocytic disorders : Leukocytosis, leukopenia, leukemoid reaction

m) Acute and chronic Leukemia : Classification, Diagnosis

n) Myeloproliferative disorders : Polycythemia, Myelofibrosis

o) Multiple myeloma and dysproteinemias

p) Blood transfusion : grouping and cross matching, untoward reactions, transmissible infections including HIV and hepatitis

6. **Liver and Biliary Tract Pathology**

a) Jaundice : Types, Pathogenesis and Differentiation

b) Hepatitis : Acute and Chronic, Etiology, Pathogenesis and Pathology

c) Cirrhosis: Etiology, Postnecrotic, Alcoholic, Metabolic, Pathology, Morphology (Macronodular, Micronodular, Mixed), complications

d) Portal Hypertension : Types including non-cirrhotic portal fibrosis and Manifestations

e) Tumors of Liver : hepatocellular and metastatic carcinoma, tumor markers

f) Concept of hepatocellular failure

g) Diseases of the gall bladder : Cholecystitis, Cholelithiasis, Carcinoma

7. **Lymphoreticular System**

a) Lymphadenitis : nonspecific, Granulomatous

b) Hodgkin's and Non-Hodgkin's Lymphomas : Classification, Morphology

c) Diseases of the spleen : Splenomegaly causes and effects

d) Thymus : Dysgenesis, Atrophy, Hyperplasia, Neoplasia

8. **Reproductive System**

a) Diseases of cervix : cervicitis, cervical carcinoma, etiology, types and cytologic diagnosis

b) Hormonal influences and histological appearances of different phases of menstrual cycle and the abnormalities associated with it

c) Diseases of uterus : endometritis, endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors

d) Trophoblastic disease : Hydatidiform mole, Choriocarcinoma

e) Diseases of the breast : Mastitis, abscess, Fibrocystic disease, Neoplastic lesions : Fibroadenoma, Carcinoma, Phyllodes tumor

f) Prostate : Nodular Hyperplasia and Carcinoma

g) Ovarian and testicular tumors

h) Carcinoma of penis

i) Pelvic inflammatory diseases including salpingitis

j) Genital Tuberculosis

9. **Osteopathology**

a) Bone – general considerations, reactions to injury and healing of fractures

b) Osteomyelitis : Acute, Chronic, Tuberculous, Mycetoma

c) Metabolic diseases : Rickets/Osteomalacia, Osteoporosis, Hyperparathyroidisism

d) Tumors : Primary, Osteosarcoma, Osteoclastoma, Ewing's Sarcoma, Chondrosarcoma; Metastatic

e) Arthritis : Rheumatoid, Osteo and tuberculous

10. **Endocrine Pathology**

a) Scope of endocrine control and investigations

b) Diabetes Mellitus : Types, Pathogenesis, pathology

c) Nonneoplastic lesions of thyroid : Iodine deficiency goiter, autoimmune thyroiditis, thyrotoxicosis, myxedema

d) Tumors of thyroid – adenoma, carcinoma : Papillary, Follicular, Medullary, Anaplastic

e) Adrenal diseases : Cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla

f) Parathyroid hyperplasia and tumors and Hyperparathyroidism

g) Pituitary tumors

h) Multiple endocrine neoplasia

11. **Neuropathology**

a) Structural Organization, specific cell types, and reaction patterns

b) Inflammatory disorders : Pyogenic and tuberculous meningitis, brain abscess, tuberculoma

c) CNS tumors – primary : glioma and meningioma (excluding histopathology) and metastatic

d) CSF and its disturbances : cerebral edema, raised intracranial pressure

e) Cerebrovascular diseases : Atherosclerosis, thrombosis, embolism, aneurysm, Hypoxia, Infarction and Hemorrhage

f) Peripheral neuropathies and demyelnating disorders

g) Diseases of muscles

h) Traumatic lesions of CNS

(C) Practicals

a) Identify and interpret the gross and/or microscopic features of common disorders as given above.

b) Perform with accuracy and reliability basic haematological procedures such as haemoglobin estimation, total and differential WBC count and peripheral blood smear staining, examination and report.

c) Calculate the indices and interpret the relevant significance.

d) Perform the basic laboratory haematological tests like bleeding time and clotting time

e) Perform a complete examination of the urine and detect any abnormalities

f) Grouping and cross matching of blood

g) Collect and dispatch clinical samples from patients in a proper manner

h) Interpret abnormal biochemical laboratory values of common diseases.

TEACHING AND LEARNING METHODOLOGY

Department stresses on teaching basic fundamentals of the disease process and the applied aspects relevant to the clinical subjects.

General Pathology

Taught with the help of Didactic lectures on specific topics, followed by Practicals pertaining to that topic. Besides microscopic examination, fresh specimens obtained at autopsy or surgical operations are shown.

Systemic Pathology

The following tools are employed:

i) Didactic lectures: discussing a particular topic at length in an one hour lecture

ii) Paraclinical seminars: are conducted by a combined team of pathologist and a clinician who discuss the pathophysiology and clinical aspects of the particular disease entity.

iii) Case studies: The significant and common diseases are discussed in the form of a representative clinical case in which the clinical features, the course of the disease in that particular patient and relevant laboratory investigations are discussed by a clinical faculty in an interactive manner in small groups. This is followed by demonstration of the gross and microscopic features of the disease in that case by the pathologist. This is followed by clinico-pathologic correlation.

iv) Practicals

Deals with demonstration of gross, and/or microscopic features of the disease entities.

v) Clinical case demonstration

Patients of a particular disease are demonstrated to the students by a clinical faculty in the ward, discussing the clinical features in the patient which provides them a real-life experience of studying a disease as it presents in a patient.

By a combination of above modalities/tools, student learns applied aspects of the disease process.

TEXT-BOOKS RECOMMENDED

1. Robbin's Pathologic Basis of Diseases
2. Text-Book of Pathology by Harsh Mohan

3. Roitt's Essential Immunology
4. Walter and Israel's General Pathology

EXAMINATION AND MARKS DISTRIBUTION

Total Marks	:	300
Internal Assessment	:	150
Professional Examination	:	150

Internal Assessment: Five assessments in theory and practical are held as given below

		Theory	Practical	Viva
III Semester	Mid Term	15	11	4
	End Term	15	11	4
IV Semester	Mid Term	15	11	4
	End Term	15	11	4
V Semester	End Term	15	11	4
	Total	75	55	20

Professional Examination

Theory	Paper I (General Pathology and Hematopathology)	37.5 Marks
	Paper II (Systemic Pathology)	37.5 Marks
Practicals		55.0 Marks
Viva		20.0 Marks

Theory Papers : Comprise of various types of MCQ (Single Response, Multiple True-false, Matching, Reason-Assertion, Multiple Completion) and Short Answer Questions (SAQ).

Practicals : include Conventional urine examination, Hematology exercises and Objective Structured Practical Examination (OSPE).

PHARMACOLOGY

OBJECTIVES

MBBS student, at the end of one and a half years training in Pharmacology, is expected to:

1. Understand pharmacokinetic and pharmacodynamic principles involved in the use of drugs
2. Understand and identify the various factors that can affect the action of drugs
3. Know the various routes of drug administration with advantages and disadvantages of the various routes
4. Undertake dosage calculations as appropriate for the patient and be able to select the proper drug and dose for the at risk population i.e. patients with kidney or liver disease, elderly, pregnant and lactating females, and children.
5. Understand the importance of rational prescribing of drugs and the concept of essential drugs
6. To be able to identify and monitor adverse drug reactions (ADRs) and appreciate the importance of ADR reporting
7. Know the drugs used in systemic illnesses, infections and chemotherapy etc. with main mechanism(s) of action, pharmacokinetics, uses, side-effects and indications
8. Understand the principles and practice of pharmacy
9. Understand the methods in experimental pharmacology, principles of bioassay and be able to correlate drug effects with the action of drugs at the receptors.
10. Have knowledge of common drugs and doses used for different ailments
11. Have an understanding of basic mechanism by which a drug acts
12. Should be able to select rationally from the available drugs

COURSE CONTENT

Theory

(A) General Pharmacology

a) Absorption, distribution, metabolism and elimination of drugs, routes of drug administration

b) Basic principles of drug action

c) Adverse reactions to drugs

d) Factors modifying drug response

(B) Autonomic nervous system & Peripheral nervous system

a) Neurohumoral transmission

b) Sympathetic nervous system - sympathomimetics, sympatholytics

c) Parasympathetic - Cholinergics, Anticholinergics, Ganglion stimulants and blockers

d) Skeletal muscle relaxants

e) Local anaesthetics

(C) Central nervous system

a) General principles - neurotransmitters, definition and common transmitters

b) Drug therapy of various CNS disorders like epilepsy, depression, Parkinson's disease, schizophrenia, neuro- degeneration etc.

c) Pharmacotherapy of pain

d) General anaethetics

e) Drugs for arthritides & gout

(D) Autacoids

a) Histamine and antihistaminics

b) Prostaglandins, leukotrienes, thromboxane and PAF

c) Substance P, bradykinin

(E) Cardiovascular system

a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias

b) Renin angiotensin system

c) Diuretics

d) Coagulants and anticoagulants, antiplatelet drugs

e) Hypo-lipidemics

(F) Gastrointestinal and respiratory system

a) Emetics and antiemetics

b) Drugs for constipation and diarrhoea

c) Drug treatment of peptic ulcer

d) Drug therapy of bronchial asthma

e) Pharmacotherapy of cough

(G) Hormones

a) Reproductive hormones - testosterone, estrogen, progesterone, contraceptives

b) Drug therapy of Diabetes

c) Thyroid hormones

d) Pituitary-hypothalamic axis
e) Corticosteroids
f) Oxytocin and drugs acting on uterus
g) Drugs affecting calcium balance

(H) Chemotherapy

a) General principles of antimicrobial chemotherapy, rational use of antibiotics
b) Chemotherapeutic agents - Penicillins, cephalosporins, fluoroquinolones, macrolides, aminoglycoside, tetracyclines, chloramphericol and polypeptide antibiotics etc.
c) Chemotherapy of tuberculosis, leprosy, UTI
d) Chemotherapy of parasitic infection
e) Chemotherapy of fungal infections
f) Cancer Chemotherapy

(I) Miscellaneous

a) Immunomodulators
b) Drug therapy of glaucoma and cataract
c) Treatment of poisoning

PRACTICALS

A) Experimental pharmacology exercise on isolated organ

- Assay of various drugs using guinea pig ileum
- Identification of unknown drugs by evaluating its action antagonism and drug interaction on guinea pig ileum
- Determination of concentration of unknown drug solution by different methods

B) Experimental exercise on pharmacy

- General principles of pharmacy
- Prescription writing exercises
- Preparation and dispensing of powders, emulsions ointments, mixtures, liniments, suppositories and syrups

C) Spotting exercise - Identify the commonly used items in Pharmacology

D) Exercises on drug interactions

TEACHING AND LEARNING METHODOLOGY

The pharmacology teaching shall be done with the goal of making the student understand the concept of rational use of drug.

General pharmacology and systemic pharmacology

It shall be taught by way of lectures. Each lecture session will be planned to deliver maximum relevant information to the student. The clinical aspects as well as rationality of use of a given drug shall be discussed with the students. In addition, seminars on some important topics will be planned in which the use of a given drug shall be discussed by a clinical expert in the field.

Practicals

The given practical exercise shall be discussed and demonstrated beforehand to the students. In addition, the students will learn prescription writing and discuss exercise on drug interactions and shall also be shown various spots. The spots shall include various chemicals, drugs and instruments used in pharmacology.

TEXT-BOOKS RECOMMENDED

1. Goodman & Gilman's - The Pharmacological Basis of Therapeutics
2. Basic & Clinical Pharmacology by Bertram G, Katzung
3. Clinical Pharmacology by DR Lawrence, PN Bennett & MJ Brown
4. Essentials of Medical Pharmacology by K.D. Tripathi
5. Pharmacology and Pharmacotherapeutics by RS Satoskar, SD Bhandarkar, SS Ainapure
6. Fundamental of Experimental Pharmacology by MN Ghosh

EXAMINATION AND MARKS DISTRIBUTION

Total Marks	200
Internal Assessment	100
Professional Examination	100

Internal Assessment : Five assessments in theory and practical are held as given below:

		Theory	Practical	Viva
III Semester	Mid Term	10	5	5
	End Term	10	5	5
IV Semester	Mid Term	10	5	5
	End Term	10	5	5
V Semester	End Term	10	5	5
	Total	50	25	25

Professional Examination

Theory	Paper I	25 Marks
	Paper II	25 Marks
Practicals		35 Marks
Viva		15 Marks

ANAESTHESIOLOGY

The purpose of anesthesia training for medical students is not to make anesthesiologists out of all medical students, but to give students knowledge of basic concepts used in anesthesia and to teach them skills of airway management and vascular access that may be useful to them in other areas of medical practice.

The physician should have a good knowledge of what the anesthetic will do to the patient, even though the physician does not administer it him or herself.

The student, therefore, should observe and study the physiological changes which take place in the anesthetized patient. When these changes are of sufficient magnitude, they become complications or toxic effects. The student should learn what these are, how they are caused, and how they may present and be treated. Emphasis should be laid on good preoperative preparation. Students should learn basic techniques of maintaining a clear airway and giving assisted or artificial ventilation. They should also learn how to position the patents head, how to hold the chin and how to insert an airway. Medical students should learn enough about an anesthetic machine.

In addition to these technical accomplishments, the student may have the opportunity to administer either general or spinal anesthesia under the direct and constant supervision of a member of the staff.

OBJECTIVES

Knowledge

The students, at the end of their posting should be able to:

1. Introduce principles of acute medicine as it is practiced in managing the anesthetized patient in the operating room and in managing the patient in the recovery unit.
2. Discuss and demonstrate principles of applied physiology and applied pharmacology. Simulation on Human patient Simulator (HPS) Is ideal to teach many aspects of applied physiology and pharmacology.
3. Review principles of and teach skills in resuscitation (cardiopulmonary, cerebral, fluid and others).
4. Teach care of the unconscious patient, including airway and ventilation management.
5. Teach management of blood ,fluid, electrolyte balance , and metabolic disturbances in the surgical

patient, with specific emphasis on those derangements which are encountered in the anesthetized patient.

6. Review management of acute and chronic pain problems.
7. Introduce concepts of drug interactions, especially as they apply to patients receiving anesthesia.
8. Demonstrate the evaluation of patients relative to surgical and anesthetic risk. Teach appropriate preoperative preparation of patients subjected to surgery and anesthesia.
9. Introduce the various techniques of anesthesiology.
10. Pharmacology of muscle relaxant, application and monitoring
11. Pharmacology : Basic / Applied of local anaesthetics : Various types of blocks advantages / Problems with each. Descriptive for same main blocks. Local inflitration , Brachial Plexus, Caudal etc.

Skills

Maintenance of Clear airway

Bag Mask Ventilation

Starting A Venous Access

CPR — Basic and advanced

Giving a simple infiltration block, Some nerve block

Performing A lumbar puncture

TEACHING LEARNING METHODOLOGY

Teaching and learning in anesthesiology should be guided through a series of posting in which the emphasis is laid on practical hands –on experience.

Human patient simulator (HPS) be purchased for better skill development and to reduce the danger to the patients during the learning curve of student. To allow repeat practice according to ability of the student to reach the level of competence needed.

Posting Schedule

Two Weeks in 7th semester

To achieve the objectives The students will be posted to

Preanesthetic Clinic : 1

1 Preoperative evaluation & optimization.

2 Operating theatre: Anaesthetic Machine /monitoring, Anaesthetic Techniques

3 Recovery Room: Recovery criteria : Management of complications.

4 Intensive Care Unit : Management of respiratory failure Various types of ventilatory Assistance devices Monitoring Devices and application.Management of patient in Coma.

5 Pain Clinic : Evaluation of patient / non invasive / invasive management.

Emergency On Call

The Intern will be posted to same areas as above and Will be asked to follow a case from preoperative preparation to full recovery to get an idea of comprehensive Care.

A log book will need to be completed by the student under the supervision of the faculty member

LOG BOOK

Skills

I/V Cannulation	5
Oropharyngeal/Nasopharyngeal Airway insertion	10
Bag Mask Ventilation first on Mannekin	5
Mask Ventilation in unconscious patient	5
Attaching pulse oximeter,BP cuff and ECG electrodes and setting up a monitor	5
Lumbar puncture	2
Infiltration block	2
Demonstration of epidural/nerve block	2 each
LMA insertion demo	5
Intubation demo	5
CPR on mannekin	5

TEXT BOOK RECOMMENDED

1. "The book of Anaesthesia" edited by Alan R. Aitkenhead, David J. Rowbotham, Graham Smith published by Churchill Livingstone.
2. "Fundamentals of Anaesthesia" edited by Colin Pinnock, Ted Lin, Tim Smith Published by Greenwich Medical Media Ltd.

Reference Books

1. Fundamental Principles and practice of Anaesthesia, Ed. Petter Hurtton, Cooper Butterworth, Published by Martin Dunitz, 2002.
2. Principles and Practice of Anaesthesiology Edited David E. Longnecker Published by Mosby St. Louis.

COMMUNITY MEDICINE

The broad goal of teaching in Community Medicine is to prepare the student to function effectively as a community physician.

OBJECTIVES

At the end of the course, the student should be able to:

1. Describe the concepts of community health and measures of levels of health.
2. Describe the epidemiological methods.
3. Apply appropriate epidemiological methods to communicable and non-communicable diseases in the hospital and community situations.
4. Use epidemiological tools to make rational decisions relevant at the individual and community levels.
5. Describe and use basic bio-statistical methods.
6. Select, use and interpret bio-statistical methods to make inferences from hospital/community data.
7. Describe the demographic pattern of the country and its relation to health.
8. Define vital statistics and describe the various methods that are used to collect vital statistics in India.
9. Describe environmental hazards - inside the home, at the workplace and in the community.
10. Describe and analyze the importance of water and sanitation in human health.
11. Suggest feasible methods of environmental control at household and community levels.
12. Describe common occupational hazards in industries, agriculture, and services available to industrial workers.
13. Describe feasible methods of control of occupational hazards.
14. Plan, collect, analyze, interpret and present data from a hospital/community survey.
15. Describe and analyze the roles of the individuals, family, community and socio-cultural milieu in health and disease.
16. Diagnose and manage maternal and child health problems and advise couples and the community on

the family planning methods available.

17. Diagnose and manage common nutritional problems at the individual and community levels.
18. Describe the methods of nutritional assessment in the community.
19. Describe the important/common health problems in India.
20. Describe the School Health Programme
21. Describe the health information system in India with reference to the Management Information System.
22. Describe and evaluate the National Health Programmes.
23. Describe the health care delivery system in India.
24. Describe the organization and functions of the health care team at Primary Health Centre, Community Health Centre and District levels.
25. Interact with other members of the health care team and participate in the organization of health care services and implementation of National health Programmes.
26. Plan and implement measures for disaster management.
27. Describe the principles and components of primary Health Care, National Health Policy and its implementation in the country.
28. List the goals/ targets set to achieve Health for All by 2010 A.D.
29. Diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources, prevailing socio-cultural beliefs and family resources.
30. Plan and implement an intervention programme with community participation.
31. Plan and implement, using simple audiovisual aids, a health educational programme and carry out its evaluation.

COURSES

1. BEHAVIORAL SCIENCES

Objectives

At the end of the course the student should be able to:

1. Define social & behavioural sciences and discuss their role in Community Medicine.
2. Describe the role of the family/community in health and disease.
3. Measure the socio-economic status of a family and describe its importance in health and disease.
4. Construct, pre-test and validate questionnaire/interview schedule.
5. Define attitudes.
6. Describe the process of attitudinal development and methods to change.
7. Construct, pretest and validate a questionnaire / interview schedule to test attitudes of a community.

Contents

- Culture, Society and Health
- Role of Family in health and disease
- Health, illness behaviour
- Social Organization and Community Participation
- Measurement of Socioeconomic Status and its importance in relation to health and disease.
- Questionnaire/Interview schedule designing
- Practical: Construction and pre-testing of questionnaire/ interview schedule
- Attitudes: nature, development, methods to change
- Measurement of attitudes
- Questionnaire design to test attitudes.

2. HEALTH EDUCATION

Objectives

At the end of the course the student should be able to:

1. Describe health education and its methods.
2. Communicate effectively with the individual, family and community.
3. Plan and conduct health Education sessions for an individual/community.
4. Design different health education aids e.g. posters, scripts for role-play, film etc.
5. Use different health education aids, video etc. to educate the community.
6. Evaluate the health education programme.

Contents

- Definition and principles of health education
- Health educational methods
- Audiovisual aids
- The art of communication
- Skills of communication
- Methods of overcoming resistance in the individual, family and community.
- Planning a health educational programme
- Use of other aids in health education
- Evaluation of health educational activities
- Information Education Communication Strategies
- Practical exercise: preparing and delivering a health educational talk on simple issues:
    - Personal hygiene
    - Clean water
    - Clean domestic environment

- Clean external environment
- Dental hygiene
- Any other topic

3. ENVIRONMENT

Objectives

At the end of the course the student should be able to:

1. Describe the physical environment inside the home, at the workplace and in the community, and its impact on health and disease.
2. Describe the family environment.
3. Suggest appropriate methods for improving the internal/external environment.
4. Define safe water. Describe the sources of water (tap, hand pump, well).
5. State the criteria (national and WHO) for safe water.
6. Describe appropriate methods for making water safe at the domiciliary level.
7. Describe sources of waste and methods of waste control at individual and community levels.
8. Define air pollution, causes of air pollution and describe appropriate measures of control.
9. Describe the effects of noise and radiation on health.
10. Describe the common vectors of diseases and methods of vector control.
11. Describe the various insecticides that are used for vector control.
12. Describe insecticide resistance.

Contents

- Environment:
  – housing
  – physical environment inside and outside the home
  – family environment
- Water
- Waste
- Air pollution, green house effect, ozone layer
- Noise and radiation pollution
- Vectors of disease
- Vector Control and insecticidal resistance.

4. BIOSTATISTICS

Objectives

At the end of the course the student should be able to:

1. Define, calculate and interpret commonly used statistical methods.
2. Select and use appropriate diagrammatic representations of statistical data.

3. Define probability.
4. Define normal distribution.
5. Define bias, random error.
6. Describe methods of sampling and calculate sample size.
7. Carry out random and cluster sampling.
8. Describe the demographic pattern of the country.
9. Define vital statistics, describe their method of collection.
10. Describe the sources of data and their merits for use and census in India.

Contents

- Need of Bio-statistics in Medicine
- Statistical Methods
- Frequency Distribution
- Measures of Central Tendency.
- Proportions
- Tabular & diagrammatic presentation of data probability
- Normal Distribution
- Standard error estimation
- Tests of Significance
- Alpha, Beta error
- Confidence Interval
- Bias/Random errors
- Sample size calculation
- Sampling methods
- Practical exercise in - random sampling - cluster sampling (EPI) Vital Statistics, census
- Demography

5. EPIDEMIOLOGY

Objectives

At the end of the course, student should be able to:

1. Define measures of morbidity/mortality.
2. List and describe the sources of epidemiological data.
3. Describe, with suitable examples, Bradford Hills' criteria of causation.
4. Describe and illustrate natural history of a disease with suitable examples (communicable and non-communicable).
5. Collect relevant clinical, psychosocial information from a patient and family, analyze and present to illustrate the natural history of a common disorder.

6. Advise relevant (psychosocial, cultural and economic context) promotive, preventive, curative and rehabilitative measures for the disorder.
7. Describe the need and uses of screening tests.
8. Differentiate between screening and diagnostic tests.
9. Calculate the sensitivity, specificity, positive predictive value of tests given a set of data.
10. Describe the various types of epidemiological study designs, their application, biases, statistical analyses, relative merits and demerits.

Contents

- Definitions, scope in hospital, community, planning
- Measures of Morbidity/Mortality
- Rates: Incidence, Prevalence
  - Death rate
  - Crude rates/standardized rates
  - Fertility Rates Years
  - Person Years
  - Ratio
  - Proportions
  - Risk
  - Sources of epidemiological data
  - Causation
  - Natural history of disease for communicable and non-communicable diseases.
  - Levels of disease prevention
  - Clinico-psycho-social case review
  - Principles of control of communicable disease
  - Principles of control of non-communicable disease
  - Measurement
  - Screening Tests
  - Diagnostic Tests
  - Cross sectional and case studies
  - Longitudinal study
  - Case control study
  - Randomized Control Trials

6. NUTRITION

Objectives

At the end of the course the student should be able to:

1. Describe the nutrients (carbohydrates, proteins, fats, vitamins and minerals) and their dietary sources.

2. Describe the daily nutritional requirements for different ages, sexes, pregnant and lactating women.
3. Describe the deficiency disorders (both macro and micro nutrimental status).
4. Describe the features of Protein Energy Malnutrition.
5. Describe the various methods of measuring the nutritional status.
6. Assess the nutritional status of the community.
7. Define balanced diet.
8. Prescribe a balanced diet within the socio-cultural, and economic milieu for
   - a normal adult male/female
   - a pregnant/lactating/postpartum woman
   - an under five child
   - an adolescent
9. Describe the management of PEM affected child in community.
10. Describe and prioritise the nutritional problems in India.
11. Describe the importance of salt fortification.
12. Describe the nutritional programmes in India.
13. Define food adulteration and describe the methods for detecting and controlling food adulteration.

Contents

- Role of nutrition in health and disease
- Nutritional requirements and sources
- Balanced Diet
- Deficiency Disorders and Micronutrient Deficiencies
- Salt fortification
- Protein Energy Malnutrition
- Nutritional problems in India
- Nutritional programmes
- Assessment of nutritional status in community; Growth Charts.
- Practical exercise:- nutritional status assessment in community. Presentation
- Food adulteration

7. MATERNAL & CHILD HEALTH

Objectives

At the end of the course the student should be able to:

1. State the magnitude of the problems of maternal and child health in India.
2. Advise a mother on the importance of breast feeding and weaning at appropriate time and addition of weaning foods.
3. Identify and manage high risk mothers and children.

4. Define an eligible couple. Calculate eligible couple protection rate.
5. Describe the various family planning methods. Describe the indications, contraindications, side effects and complications of the methods.
6. Advise a couple on spacing and terminal methods.
7. Describe salient features of National Population Policy 2001-02.

Contents

- Magnitude of the problem
- Maternal morbidity and mortality, under five morbidity mortality.
- Breast feeding/Weaning
- High risk mothers and children
- Family Planning Methods: Spacing and Terminal Methods and emergency contraception
- Practical exercise: observe:
  - insertion of IUD
  - MTP
  - tubal ligation
  - vasectomy

8. REHABILITATION

Objectives

At the end of the course the student should be able to:

1. Define and describe the different types of rehabilitation.
2. Define and describe the different types of impairment, disability and handicap.
4. Make a community assessment of post polio residual paralysis.
4. Advise rehabilitation at individual and community levels.

Contents

- Need for Rehabilitation. Types of rehabilitation. Types of impairment, disability, handicap
- Assessment of Postpolio Residual Paralysis
- Rehabilitation at individual level
- Community based rehabilitation
  - Practical exercise: Post Polio residual paralysis assessment. Presentation.

9. EPIDEMIOLOGY OF COMMUNICABLE DISEASES AND NON-COMMUNICABLE DISEASES

Objectives

At the end of the course the student should be able to:

1. Describe the epidemiology of common communicable diseases.

2. Describe the epidemiology of common non-communicable diseases.
3. Describe the steps involved in investigating an epidemic.
4. Plan and investigate an epidemic of a communicable disease in a hospital/ community setting, and institute control measures.
5. Describe the immunization schedule and side effects of the immunizing agents.
6. Immunize a child.
7. Describe the cold chain and the importance of maintaining the cold chain.

Contents

- Malaria
- STDs / HIV/AIDS
- Pulmonary Tuberculosis
- Leprosy
- Diphtheria, Pertussis, Tetanus
- Poliomyelitis
- Measles, Mumps & Rubella
- Chicken, A.R.I.
- Diarrhoeal Diseases
- Infective Hepatitis
- Kala azar
- Arbo viral diseases
- Filaria
- Plague
- Intestinal infestations
- Investigation of an Epidemic
- Immunity
- Immunization schedule
- Cold chain
- Immunization for international travel
- Surveillance for diseases
- Nutritional Disorders
- RHD /CHD / Hypertension
- Cancers
- Blindness
- Road Traffic Accidents
- Diabetes mellitus
- Obesity

10. IMPORTANT NATIONAL HEALTH PROGRAMMES

Objectives

At the end of the course the student should be able to:

1. Describe the national health programmes for the control of communicable diseases.
   - RCH
   - Immunization
   - Family Welfare
   - Iodine Deficiency Disorders
   - ARI
   - Tuberculosis
   - Diarrhoeal diseases
   - Malaria
2. Describe the national health programmmes for control non-communicable diseases.
3. Describe the role of the health services in these programmes.
4. Evaluate an important health programme.

Contents

- Health Programmes on:
- RCH (including ARI, Diarrhoeal Diseases)
- Immunization
- Family Welfare
- Iodine Deficiency
- Nutrition, ICDS
- Tuberculosis
- Malaria, Filaria, Kala Azar
- Evaluation of a health programme
- HIV/ AIDS & STDs
- Leprosy
- RHD/ CHD/ Hypertension
- Diabetes
- Blindness
- Cancer

11. OCCUPATIONAL HEALTH

Objectives

At the end of the course the student should be able to:

1. Describe the common industrial and occupational diseases.

2. Describe the feasible methods of control of occupational diseases.
3. Describe the important features of the Workman Compensation Act and provision of health services and health insurance to industrial workers.

Contents

- Working environment, health hazards of industrial and agricultural workers
- Common occupational lung diseases
- Common occupational skin diseases and cancers
- Industrial Toxic Substances
- Principles of prevention of Occupational diseases
- Legal status in relation to Workman Compensation Act
- Employees' State Insurance Act
- Practical exercise - visit to a factory

12. HEALTH ADMINISTRATION

Objectives

At the end of the course, the student should be able to

1. Describe the organization of health services at all levels and the School Health Programme.
2. Describe the concepts, components, principles of primary health care.
3. Describe natural and man made disasters and disaster management.
4. Functions of various categories of workers at PHC.

Contents

- Planning and organizational set up of health services in India
- Primary Health Care
- Health Team at District Hospital, Community Health Primary Health Centre
- School Health
- Management of health resources
- Voluntary and international agencies in health care
- Natural and manmade disasters and disaster management

13. HEALTH ECONOMICS

Objective

At the end of the course, the student should be able to:

1. Appreciate cost considerations in clinical and public health interventions.

Contents

- Need of health economics
- Methods of economic analyses in health

14. GERIATRICS

Contents

- Problems of the elderly
- Social organizations to assist the elderly

15. COUNSELLING

Objective

– At the end of the course the student should be able to:
– Understand the need for counselling in various situations ego HIV infection, AIDS, sexuality, Family Planning etc.

Contents

- The students will observe counselling being done in the various situations.

FIELD POSTINGS IN COMMUNITY MEDICINE

1. Urban Health Posting during the IV and V Semesters: (Duration : 8 Weeks)

Objectives

At the end of the posting, the student should be able to:

1. Manage common ailments at primary level in the urban community.
2. Understand the medico-social problems of patients attending the mobile clinic.
3. Understand the art of counselling in sex and marriage problems.
4. Understand the pattern and utilization of patient referrals.
5. Describe the existing health care services available to the urban community.
6. Study a health related problem in the community.

Learning Experiences

1. Attending Malviya Nagar Hospital to learn services available at secondary level.
2. Attending the Sex and Marriage Counselling clinic at AIIMS to learn the art of sex and marriage counselling.
3. Attending the Mobile clinic at slum areas to learn about the patterns of morbidity, care of patients and referrals at primary level.
4. Clinico-psycho-social review:L Each student will be allotted a case in the community to take history and do a complete physical examination and reach a diagnosis. This will be followed by a visit to the patient’s family to determine the psycho - social aspects of the disease and the effects on the patient and family. The student will also have to advise appropriate intervention, Individual presentation.
5. Participating in the immunization, health education activities and special exercises like survey.
6. Participating in the delivery of health care to the urban community.

Urban Health Posting during the IV and V Semesters:

Assessment/Evaluation:

Total marks: 50

Health Talk	15%
CPSCR presentation and submission of case report	15%
Project work presentation and report submission	15%
SMCC counselling work and submission of case reports	10%
Field performance	20%
End posting viva	25%

2. Family Health Advisory Service (FHAS) during IVth & Vth Semester MBBS (Once a Week, 3-5 PM)

Objectives

1. To understand the dynamics of Health & Disease in a family.
2. To study the family structure and health status of the individual members with special reference to:
   (a) Nutritional status
   (b) Immunization status
   (c) General Health status
   (d) Environmental status
   (e) Socio-Economic status
   (f) Family Welfare Planning status
3. To identify the Health problems of families over a period (of posting).
4. To assess the knowledge, attitude, behaviour and practices regarding health and disease.
5. To identify the communication and decision making process in the family, and utilization of health services by the families.
6. To counsel the family in solving their health problems and to educate the families to improve their health and family welfare.
7. To provide services to the families allotted (with the help of FHAS Team).

Methodology

The whole class is divided into two (2) batches and each batch will have two **faculty supervisors** during field visits as well as in briefing. The junior residents will act as **preceptors.** Each batch visits the allotted families along with preceptors once a week and discuss the findings with faculty supervisor next week.

The students will also maintain a record of their family visits and present the family's case history book at the end of the posting.

Evaluation

Students will be evaluated in the following manner:

Total Marks: 50

1. 50% marks for field performance
2. 15% marks for FHAS Record Book.
3. 35% marks for end-posting viva-voce exam.

3. Rural Posting during the VII Semester: Duration : 6 Weeks

Objectives

At the end of the posting, the student should be able to:

1. Manage patients at the primary and secondary level in a rural setting.
2. Describe the factors which contribute to or affect health practices.
3. Describe the important statistical data of Ballabgarh project and to compare them with the National figures.
4. Conduct an epidemiological study, plan and execute an intervention programme in a rural community.
5. Describe the model of health care delivery in rural areas and the National Health Programmes.
6. Describe the hazards of asbestos, the prevention and management of asbestosis.

Learning Experiences

1. Management of patients at the secondary level:

A list of diseases which are seen commonly in Ballabgarh is provided (Appendix). During the posting student must find the opportunity to see the entire spectrum. If, because of seasonal variation it is not possible to see patients suffering from certain diseases, student should make it a point to examine such patients in the AIIMS hospital.

While examining patients the following is to be learnt:

History taking

Complete physical findings

Relevant differential diagnosis

Relevant investigations

Management to include

- treatment
- follow up
- referral when necessary

Simple procedures

- intramuscular injections - passing Ryles tube
- dressings
- incision & drainage
- splinting of fractures
- perineal wash down

The students will be posted by rotation in the specialties of Medicine, Paediatrics, Gynaecology / Obstetrics, and Surgery.

Case work-up of all patients admitted under the specialties.

Teaching by faculty members from the above specialties from Wednesday to Saturday. They will discuss patients from the Ward, OPD and special clinics.

Evening rounds with Senior Residents of concerned specialty.

Demonstration of the procedures mentioned above, and if possible, the student will carry out these procedures under the supervision of the faculty member and the Senior Resident.

2. Factors which contribute to or affect health practices.

Health practices in 4 conditions will be covered. These are pulmonary tuberculosis, antenatal case, antenatal high risk case, and protein energy malnutrition in a child.

Patients will be allotted to the students for complete work up.

Family visits will be made. The families will be interviewed to ascertain the necessary information.

Discussion following each visit.

Information to be collected for each condition:

Pulmonary Tuberculosis:

Index case - occupation, literacy & social status

Social & environmental factors and their contribution to the disease

Steps taken by the patient for his own treatment

Preventive measures for other family members

Condition of the patient at the time of visit

Health education

Antenatal Case:

Literacy of the family and the woman

Customs - social or religious during pregnancy, delivery and lactation

Dietary habits - particularly restrictions during pregnancy

Knowledge, attitude & practices regarding antenatal care

High risk pregnancy - identification

Health education / Family Planning advice

Protein Energy Malnutrition:

Socio-economic status of the family

Infant feeding & weaning practices

Social customs regarding diet for children

Environmental factors contributing to malnutrition

Knowledge, attitude & practices about nutrition & steps taken for the management of child

3. Statistical data of Ballabgarh Project and comparison with the national figures.

The statistics to be known are:

Birth Rate

Death Rate

Infant Mortality Rate

Maternal Mortality Rate

Eligible Couple Protection Rate

Immunization Coverage

4. Conduction of an epidemiological study.

Selection of a problem occurring in the community.

Review literature to find out the extent of the problem in the country.

Decision whether to survey the entire population or a sample using the usual sampling techniques.

Designing a proforma, pretesting and then using.

Data collected is analysed and presented to the faculty of community medicine for discussion.

A plan for feasible intervention measures is drawn up and will be executed.

The final report (typed two copies) is to be submitted within 1 week of completion of the posting.

5. Models of health care delivery in rural areas and the national health programmes:

A visit to the Chief Medical Officer's office (Faridabad) to learn the following:

organisation of services

administrative structure

functions of

- PHCs
- Rural dispensaries
- Referral hospitals
- District hospitals

collection of data at district headquarters transmission of data from district headquarters drug supply national health programmes at district level

- Malaria
- Tuberculosis
- Family Welfare
- EPI/UIP

constraints in functioning

Visits to 3 Primary Health Centres (Dayalpur, CHC Kurali and Kherikalan) to compare and contrast the functioning of all. The main objectives of these visits are to make you realise the vast gap between theory and practice of primary health care. The following will be learnt:

the functions of the PHC

roles of the following field workers

- Male Multipurpose Worker

- Female Multipurpose Worker - Male supervisor
- Female supervisor
- Dai
- Community Health Volunteer

6. Industrial health.

Visit to Hyderabad Industries, to learn the following:

Nature of work done

Occupational hazards

Clinical profile & laboratory investigations done

Statistics regarding people developing diseases

Action taken for diseased people

Preventive measures taken by the factory

Expenditure on medical & preventive measures

TEXT BOOKS RECOMMENDED

1. Text Book of Preventive Medicine by Park
2. Methods in Bio-statistics by B.K. Mahajan
3. Epidemiology by Bradford Hill

ASSESSMENT

1. **Daily assessment** by the preceptor in charge of student. This will be based on the
   - field exercise
   - visits made
   - presentation of domiciliary visits
2. **End posting assessment**

Clinical assessment will be taken by the faculty involved in teaching. The assessment will be entirely clinically oriented. Emphasis will be on:

history taking

total management (hospital & domiciliary) of the patient

demonstration of the procedures taught (if feasible)

Community Medicine

Presentation of field exercise

Viva Voce on the activities that you have observed and participated in during the posting

One question on each area will be asked. The question will be randomly selected by the student. (OSVE).

Break Up of Marks (total 50)

Clinical assessment	15
Community Medicine Viva	20
Field exercise + daily assessment	15

Teaching Schedule: Community Medicine

Semester III; August - December

Subject
Concepts in Community Health
Bio-statistics in Health
Behavioural sciences & their relevance to Community Health
Natural history of disease and levels of prevention
Measuring the burden of disease in community
Culture, habits, customs and community health
Health problem associated in urbanization & industrialization
Health situation in India
Family and its role in health and disease
Measuring vital events in community
Health seeking behavior – barriers to health
Health Planning in India
Collection of vital statistics in the community
Epidemiology as a tool for community health
Collection of data – sampling methods, sample size
Community organization in rural and urban areas – community participation
Environment and community health
Survey methods and interview techniques in community Health
Attitudes : development and measurement
Water and community health
Analysis of quantitative data
Designing interview schedules – KABP studies
Air and community health
Probabilities and conditional probabilities
Socio-economic measurement status and its role in community health
Analysis of qualitative data
Normal distribution, Bi-nominal distribution & poison Distribution
Medico-social problems, beliefs and practices related to acute and chronic diseases
Waste disposal
Tests of significance of statistical hypothesis
Indoor environment and health
Human sexuality; sex and marriage counselling

Teaching Schedule : Community Medicine

Semester IV: January – June

Subject
Introduction to nutrition and nutritional problems of India Introduction to Family Health Advisory Service and approaching the families in Community - 1
IEC & Health Education Strategies
Measurement of Nutritional Status of Community Introduction to Family Health Advisory Service and approaching the families in Community - 2
Health Education Tools & Audio-visual aids
Nutritional requirements & sources
Planning & evaluation of Health Education Programmes
Food Hygiene, Food Adulteration & Food poisoning
Introduction to Maternal & Child Health
Protein energy malnutrition, growth monitoring & promotion
Infant & Child Mortality
Breast feeding & weaning & Baby Friendly Hospitals Breast feeding promotion
High risk strategy & risk factors in pregnancy & child birth
Nutrition Programmes in India
Food habits, customs related to pregnancy, child birth & lactation
Causation & association
Reproductive and Child Health Programme
Case – Control Studies
Cohort studies
Health care of special groups : Adolescents & School Children
Cross sectional studies
Health care of Aged
Interventions trial in community
Screening methods in community

Teaching Schedule : Community Medicine

Semester Vth ; July to December

Subject
Population dynamics : Demographic cycle, demographic transition
Working environment and community health
Demographic trends in India.
Pneumoconiosis
Family planning methods : spacing methods
Health hazards faced by agricultural workers
Family planning methods : permanent methods
Industrial toxic exposures
Fertility & fertility related statistics
Prevention of occupational diseases & ESI
National Family Welfare Programme – I
Life tables and life table techniques for evaluation of family planning methods
National Family Welfare Programme – 2;
National Population Policy

Teaching Schedule : Community Medicine

Semester VI; January – June

Subject
Dynamics of disease transmission and control Immunity, Herd immunity, Immunization schedule routine & specific, Immunization : active & passive
Disinfection, disinfectants, disposal of infective material, concurrent & terminal disinfection Surveillance : Active, Passive, Sentinel and International Health Regulations
Introduction to management : Planning, Management & Evaluation Epidemiology of tuberculosis & control programme
Health services organisation Epidemiology of Malaria & Control Programme
National Health Policy : Concepts of Health Care, Primary Health Care Epidemiology of Leprosy and Control Programme
Functions of Primary Health Centre : Health care team training & supervision Epidemiology of Filariasis & Control Programme
Voluntary agencies & International Health agencies Epidemiology of Diphtheria and Pertussis & Control Programme
Health Resources Management : Personnel and Material Epidemiology of tetanus/ tetanus Neonatorum & Control Programme
Introduction to Health Economics Epidemiology of poliomyelitis & control programme
Epidemiology Kala-azar & Control Programme Epidemiology of Viral Hepatitis & Control
Epidemiology of Typhoid & Control Epidemiology of Diarrhoeal Diseases and Control Programme
Epidemiology of Measles, Mumps, Rubella & Control Epidemiology of re-emerging diseases : Plague, Yellow Fever, Influenza, Meningococcal Meningitis
Epidemiology of re-emerging diseases : Dengue, J. E., Encephalitis, KFD Epidemiology of Rabies & Control
Epidemiology of Chicken Pox & Control, Small Pox Eradication Epidemiology of Helminthic and Protozoal Infections and Control (Hookworm, Round worm, Amoebiasis, Guinea worm)
Epidemiology of Sexually Transmitted Diseases including AIDS & Control

Teaching Schedule : Community Medicine

Semester VIII; January – June

Subject
Demographic and Epidemiological Transition in India
Epidemiology and Control of Blindness
Epidemiology and control of cancers with Special reference to cancer of cervix and breast cancer, tobacco related cancers, lung cancer, head and neck cancer
Epidemiology and Control of Accidents
Epidemiology and Control of Cardio Vascular Diseases
Epidemiology and Control of Diabetes Mellitus

EXAMINATION/ MARKS ALLOTTED TO COMMUNITY MEDICINE

Total Marks = 600 (Theory = 300, Practicals = 300)

Distribution:

• Internal Assessment	:	150	Distributed equally In theory and
• Pre-Professional Exam*	:	150 practicals	
• Professional Exam*	:	300	

*Conducted in the IX Semester with other subjects (Medicine, Surgery, Obs-Gynae, Paediatrics etc.) in the IIIrd Professional.

Internship Programme in Community Medicine

During one year of internship, the interns are posted for 3 months at Comprehensive Rural Health Services Project at Ballabgarh (Haryana) – 36 kms. away from the Institute.

In this fully residential posting, the distribution of posting is as under:

(a) Six weeks posting at Ballabgarh Hospital (a 60 bedded, secondary care level hospital) : This posting aims to train the interns in managing common health problems at secondary level. They are specifically trained in the specialities of Paediatrics, Obs.-Gynae, Surgery and Medicine under the direct supervision of senior & junior residents and the faculty.

(b) Six weeks posting at Primary Health Centres - Chhainsa & Dayal Pur : Situated 9–18 kms. away from Ballabgarh Hospital, these PHCs are managed by C.C.M. The interns are trained to manage common health problems at the primary level under the ambit of primary health care.

At the end of their posting, an evaluation is done for the interns.

DERMATOLOGY AND VENEREOLOGY

Skin diseases are quite prevalent in the community and a large number of patients attending to any hospital OPD come with the complaints related to skin diseases. Most skin diseases can be easily diagnosed and managed with adequate amount of training at the MBBS level. AIIMS has designed a comprehensive training syllabus for undergraduates in Dermatology, which includes the Dermatology, Venereology & Leprosy. The aim of the training is to train the candidates to diagnose and manage common skin diseases.

OBJECTIVES

Knowledge

At the end of the training a candidate should be able to-

1. Diagnose and manage common skin diseases, sexually transmitted diseases and leprosy.
2. To diagnose and manage common medical emergencies related to skin diseases, leprosy and sexually transmitted diseases.
3. To familiarize them with the common laboratory diagnostic skills which help in the confirmation of diagnosis.
4. To train them for preventive measures at individual and community levels against communicable skin diseases including sexually transmitted diseases and leprosy.
5. To develop a compassionate attitude towards the patients and their attendants.

Skills

1. History taking in dermatology, sexually transmitted diseases and leprosy.
2. Clinical examination and description of cutaneous findings in a systematic way in dermatology, sexually transmitted diseases and leprosy.
3. To have a broad idea and approach to manage common skin diseases, sexually transmitted diseases and leprosy.
4. Systematic examination in relation to dermatologic diseases.

5. To develop skills to do day-to- day common laboratory tests and their interpretation which help in the diagnosis.

COURSE CONTENT

During the MBBS training the students have a comprehensive teaching in dermatology sexually transmitted diseases and leprosy in their 6th & 8th semester training period.

1. Ineffective dermatoses: Pyoderma, tuberculosis and leishmaniasis- Etiology, Clinical features, Diagnosis and Treatment.
2. Infective dermatoses: Viral and fungal infections- Etiology, Clinical features, Diagnosis and Treatment.
3. Infestations: Scabies and pediculosis – Etiology, Clinical features, Diagnosis and Treatment.
4. Melanin synthesis: Disorders of pigmentation (Vitiligo, Chloasma / Melasma)- Etiology, Clinical features, Diagnosis and Treatment.
5. Allergic disorders: Atopic dermatitis and contact dermatitis – Etiology, Clinical features, Diagnosis and Treatment.
6. Drug eruptions, urticaria, erythema multiforme, Steven's johnson syndrome and toxic epidermal necrolysis – Etiology, Clinical features, Diagnosis and Treatment.
7. Vesiculo-bullous diseases: Pemphigus, Pemphigoid, Dermatitis herpetiformis – Etiology, Clinical features, Diagnosis and Treatment.
8. Epidermopoisis, Psoriasis, Lichen planus and Pityriasis rosea – Etiology, Clinical features, Diagnosis and Treatment.
9. Pathogenesis, Classification and clinical features of leprosy, Reactions in leprosy.
10. Diagnosis, treatment and control of leprosy.
11. Syphilis – Etiology, Clinical features, Diagnosis and Treatment.
12. Gonococcal and Non-gonococcal infections – Etiology, Clinical features, Diagnosis and Treatment.
13. Chancroid, LGV, Donovanosis, Herpes progenitalis – Etiology, Clinical features, Diagnosis and treatment.
14. Syndromic approach to the diagnosis and management of sexually transmitted diseases.
15. HIV infection, Cutaneous manifestations of HIV infection and their management.
16. Hereditary disorders: Ichthyosis, Albimism, Epidermolysis bullosa, Melanocytic naevi, Freckles and other naevi – Etiology, Clinical features, Diagnosis and Treatment.
17. Dermatological Emergencies.

Clinical Postings

During the MBBS training period the students have about 3 weeks clinical postings in the OPD (Out Patient Department), speciality clinics and ward in their 7th semester training period. They have the clinical teaching and demonstrations of all the common skin diseases sexually transmitted diseases, leprosy and common skin emergencies during this period. They also have about a week's orientation clinical posting during their 3rd semester training period to familiarize them with the history taking, clinical examination and cutaneous lesions.

Demonstration

The cases with diseases like acne vulgaris, scabies, pyoderma, pediculosis, fungal infection of skin, alopecias, sexually transmitted diseases, auto immune diseases, bullous disorders, papulosquamous disease etc. are demonstrated and discussed during the posting period.

TEXT BOOKS RECOMMENDED

1. Treatment of skin diseases – J.S. Pasricha
2. Illustrated Text Book of Dermatology - J.S. Pasricha
3. Text Book of Dermatology and Venereology – Neena Khanna
4. Atlas of Dermatology – L.K. Bhutani
5. Atlas of Sexually Transmitted Disease - L.K. Bhutani

EXAMINATION PATTERN

1. **Clinical Assessment:** The students go through an assessment at the end of their clinical postings.
2. **Theory Examination:** A separate section in Medicine paper II having the dermatology questions, for the evaluation of theoretical knowledge of candidates in dermatology, sexually transmitted diseases and leprosy.

MEDICINE

OBJECTIVES

The goal of the undergraduate training in general medicine is to provide such knowledge, skills and behavioral attribute that may enable the graduating physician to function effectively as a Primary Care Physician in a community setting. At the end of training, each student must be able to:

1. Understand the various manifestations of infectious and non-infectious diseases.
2. Understand the basic principle of history taking and clinical examinations.
3. Elicit a detailed history, perform a thorough physical examination including mental status
4. examination and examination of an unconscious patient.
5. Correlate the clinical symptoms and physical signs to make a provisional anatomical, physiological, etiopathological diagnosis along with the functional disability and suggest relevant investigation.
6. Interpret reasonably the relevant investigations.
7. Professionally present and discuss the principles involved in the management of the patient, initiate first line management and outline short-term and long term management.
8. Manage acute medical emergencies like acute myocardial infarction, acute pulmonary oedema, acute anaphylactic and hypovolumic shock, status asthmaticus, tension pneumothorax, status epilepticus, hyperpyrexia, haemoptysis, gastro-intestinal bleeding, diabetic coma, electric shock, drowning, snake bites, common poisoning etc.
9. Acquire the skills to perform minor procedure under supervision like – IV cannulation, insertion of nasogastric tube, urinary bladder catherisation, use of peak flow meter, doing an ECG etc.

COURSE CONTENT

General

- The ‘art’ and ‘science’ of Medicine
- Principles of medical ethics
- Clinical diagnostic reasoning

- Principles of prevention of disease
- Clinical genetics - common types, clinical presentation, investigation and prevention of genetic diseases and genetic counseling
- Medical disorders during pregnancy
- Principles of Geriatric Medicine
  - Normal ageing
  - Clinical assessment of frail elderly,
  - Decisions about investigations and rehabilitation
  - Major manifestations of disease in elderly
- Care of terminally ill/dying patient

Clinical Pharmacology

- Principles of drug therapy
- Adverse drug reactions
- Drug interactions
- Monitoring drug therapy
- Writing a drug prescription

Nutritional and metabolic disorders

- Nutritional assessment & needs
- Nutritional & metabolic disorders
  - Protein energy malnutrition
  - Obesity
- Vitamin and mineral deficiency & excess
- Diet therapy including parenteral nutrition therapy

Water, electrolyte and acid-base imbalance

- Water and electrolyte physiology
- Acid-base disorders
- Fluid and electrolyte disturbances

Critical care Medicine

- Physiology of the critically ill patient
- Major manifestations of critical illness
  - Circulatory failure: shock
  - Respiratory failure
  - Renal failure

    - Coma
    - Sepsis
    - Disseminated intravascular coagulation
- General principles of critical care management
- Scoring systems in critical care
- Outcome and costs of intensive care

Pain management and palliative care

- General principles of pain
- Assessment and treatment of pain
- Palliative care

Medical Psychiatry

- Classification of psychiatric disorders
- Aetiological factors in psychiatric disorders
- The clinical interview and mental state examination
- Major manifestations of psychiatric illness
    - Disturbed and aggressive behavior
    - Delusions and hallucinations
    - Depressive Symptoms
    - Anxiety symptoms
    - Deliberate self-harm and suicidal ideation
    - Alcohol misuse and withdrawal
    - Misuse of drugs other than alcohol
    - Medically unexplained physical symptoms and functional somatic syndromes
    - Psychiatric and psychological aspects of chronic and progressive disease
- Clinical syndromes
    - Organic brain syndromes
    - Substance abuse
        - Alcohol
        - Drugs
    - Bipolar disorders
    - Depressive disorders
    - Schizophrenia
- Treatments used in psychiatry
    - Psychological treatments
    - Physical treatments

- Neurotic, stress-related and somatoform disorders
  - Anxiety
  - Obsessive compulsive disorders
  - Dissociative disorders
- Sleep disorders
- Legal aspects of psychiatry

Poisonings

- General approach to the poisoned patient
- Poisoning by specific pharmaceutical agents
- Drugs of misuse
- Chemicals and pesticides
- Snake bite and Envenomation
- Other bites and stings - scorpion, spider

Specific environmental and occupational hazards

- Heatstroke and hypothermia
- Drowning and near drowning
- Electrical injuries
- Radiation injury
- Heavy metal poisoning

Immune response and Infections

- Basic considerations
  - Patterns of infection
  - Laboratory diagnosis of infections
  - Principles of immunization and vaccine use
- Clinical syndromes
  - The febrile patient
  - Fever and rash
  - Fever of unknown origin
  - Infective endocarditis
  - Intra-abdominal infections and abscesses
  - Acute infectious diarrhoeal diseases and food poisoning
  - Sexually transmitted diseases - overview & clinical approach
  - Infections of skin, muscle & soft tissues
  - Osteomyelitis

- Hospital acquired infections
- Infections in immuno-compromised hosts

Specific Infections - Epidemiology, clinical features, laboratory diagnosis, treatment and prevention of :

- Protozoal infections
  - Amobiasis
  - Malaria
  - Leishmaniasis
  - Toxoplasmosis
  - Giardiasis
  - Trichomoniasis
  - Trypanosomiasis
- Bacterial infections
  - Streptococcal infections
  - Pneumococcal infections
  - Staphylococcal infections
  - Meningococcal infections
  - Gonococcal infections
  - Legionella infections
  - Pertussis and Diphtheria
  - Tetanus
  - Botulism
  - Gas gangrene, other clostridial infections
  - Cholera
  - Salmonellosis - Typhoid and paratyphoid fevers
  - Shigellosis and bacillary dysentery
  - Brucellosis
  - Plague
  - Donovanosis (Granuloma inguinale)
  - Helicobacter Pylori
  - Infections due to pseudomonas & other gram - negative bacteria
  - Anaerobic infections
- Mycobacterial diseases
  - Tuberculosis
  - Leprosy

- Viral infections
  - Common exanthemata
    - Measles
    - Mumps
    - Rubella
    - Varicella
  - Common viral respiratory infections
  - Human immunodeficiency virus (HIV)
  - Viral gastroenteritis
  - Dengue fever
  - Rabies
- Rickettsia, Mycoplasma & Chlamydial diseases
- Fungal infections
  - Candidiasis
  - Aspergillosis
  - Histoplasmosis
  - Cryptococcosis
  - Mucormycosis
  - Pneumocystis carinii
- Helminthic infections
  - Nematodes
    - Tissue
    - Intestinal
  - Cestodes
    - Tissue
    - Intestinal

System-Based diseases

Cardiovascular system

- Clinical examination of the cardiovascular system
- Functional anatomy, physiology and investigations
- Major manifestations of cardiovascular disease
  - Chest pain
  - Breathlessness
  - Palpitation
  - Acute circulatory failure (cardiogenic shock)

  - Heart failure
  - Hypertension
  - Presyncope and syncope
  - Cardiac arrest and sudden cardiac death
  - Abnormal heart sounds and murmurs
  - Atrial fibrillation
- Disorders of heart rate, rhythm and conduction
- Congestive cardiac failure
- Rheumatic fever
- Valvular heart disease
- Ischaemic heart disease
- Congenital heart disease in the adult
- Cor pulmonale
- Hypertension
- Peripheral vascular disease
- Atherosclerosis
- Pericardial disease
- Myocarditis and cardiomyopathy

Respiratory system

- Clinical examination of the respiratory system
- Functional anatomy, physiology and investigations
- Major manifestations of lung disease
  - Cough
  - Dyspnoea
  - Chest pain
  - Haemoptysis
  - The solitary radiographic pulmonary lesion
  - Respiratory failure
- Upper and lower respiratory infections
- Bronchial asthma
- Chronic obstructive pulmonary disease
- Pulmonary tuberculosis
- Suppurative lung diseases
  - Bronchiectasis
  - Lung abscess
  - Plural effusion and empyema

- Interstitial and infiltrative lung diseases
- Occupational lung diseases
- Tumors of the bronchus and lung
- Pulmonary vascular diseases
    - Pulmonary hypertension
    - Pulmonary thromboembolism
- Acute respiratory distress syndrome
- Obstructive sleep apnoea
- Diseases of the nasopharynx, larynx and trachea
- Diseases of the mediastinum, diaphragm and chest wall

Kidney and genitourinary system

- Clinical examination of the kidney and genitourinary system
- Functional anatomy, physiology and investigations
- Major manifestations of renal and urinary tract disease
    - Dysuria, pyuria, urethral symptoms
    - Disorders of urine volume
    - Hamaturia
    - Proteinuria
    - Oedema
    - Obstruction of the urinary tract
    - Incontinence
- Acute and chronic renal failure
- Infections of the kidney and urinary tract
- Congenital abnormalities of the kidneys and urinary system
- Glomerulonephritides
- Tubulo-interstitial diseases
- Renal involvement in systemic disorders
- Drugs and the kidney
- Renal vascular diseases
- Urinary tract calculi and nephrocalcinosis
- Tumors of the kidney and genitourinary tract
- Renal replacement therapy

Gastrointestinal tract

- Clinical examination of the abdomen
- Functional anatomy, physiology and investigations particularly role of imaging, endoscopy and tests of function

- Major manifestations of gastrointestinal disease
  - Abdominal pain (acute and chronic)
  - Dysphagia
  - Dyspepsia
  - Vomiting
  - Constipation
  - Diarrhoea
  - Abdominal lump
  - Weight loss
  - Gastrointestinal bleeding - upper and lower
  - Approach to the patient with gastrointestinal disease
- Diseases of the mouth and salivary glands - oral ulcers, candidiasis, parotitis
- Diseases of the oesophagus - GERD, other motility disorders, oesophagitis, carcinoma oesophagus
- Diseases of the stomach and duodenum - gastritis, peptic ulcer disease, tumors of stomach
- Diseases of the small intestine
  - Acute gastroenteritis & food poisoning
  - Intestinal tuberculosis
  - Inflammatory bowel disease
  - Malabsorption syndrome
  - Tumors of small intestine
  - Acute, sub-acute and chronic intestinal obstruction
- Disorders of the colon and rectum
  - Bacillary dysentery
  - Amoebic colitis
  - Ulcerative colitis
  - Tumors of the colon & rectum
  - Irritable bowel disease
- Abdominal tuberculosis
    - Peritoneal
    - Nodal
    - Gastrointestinal
- Ischaemic gut injury
- Anorectal disorders
- Diseases of the peritoneal cavity
  - Acute and chronic peritonitis
  - Ascites
  - Peritoneal carcinomatotis

Diseases of the pancreas

- Acute and chronic pancreatitis
- Tumors of pancreas

Liver and Biliary tract disease

- Clinical examination of the abdomen for liver and biliary disease
- Functional anatomy, physiology and investigations of hepatobiliary disease
- Major manifestations of liver disease
  - 'Asymptomatic' abnormal liver function tests
  - Jaundice
  - Acute (fulminant) hepatic failure
  - Portal hypertension and ascites
  - Hepatic (portosystemic) encephalopathy
  - Hepatorenal failure
- Liver abscess - amoebic & pyogenic
- Viral hepatitis - acute and chronic
- Alcoholic liver disease
- Cirrhosis of liver and chronic liver disease
- Drugs, toxins and liver
- Fatty liver and non alcoholic steatohepatitis
- Infiltrative diseases of liver
  - Wilson's disease
  - Hemachromatosis
- Tumors of the liver
- Gallbladder and biliary tract diseases
  - Functional anatomy
  - Acute and chronic 'cholecystitis'
  - Cholelithiasis
  - Tumors of gall bladder and bile ducts

Endocrinology and Metabolism

Diabetes mellitus

- Clinical examination of the patient with diabetes
- Epidemiology
- Physiology, pathophysiology and investigations
- Aetiology and pathogenesis

- Major manifestations of disease
  - Hyperglycaemia
  - Acute metabolic complications
    - Diabetic ketoacidosis
    - Hyperglycemic non-ketotic coma
    - Hypoglycemia
  - End organ damage
- Management of diabetes
- Long-term complications (micro and macrovascular)
- Long-term supervision
- Special problems in management
- Prospects in diabetes mellitus

Thyroid gland

- Clinical examination of thyroid disease
- Functional anatomy, physiology and investigations
- Major manifestations of thyroid disease
  - Hyperthyroidism
  - Hypothyroidism
  - Thyroid enlargement
  - Abnormal thyroid function test results

The reproductive system

- Major manifestations of reproductive disease
  - Male hypogonadism
  - Gynaecomastia
  - Impotence
  - Short stature and delayed puberty
  - Cryptorchidsm
  - Hirsutism
  - Secondary amenorrhoea
  - Infertility

The parathyroid glands

- Major manifestations of diseases of the parathyroid glands
  - Hypercalcemia
  - Hypocalcemia

The adrenal glands

- Major manifestations of adrenal disease
  - The ‘Cushingoid’ patient
  - Adrenal insufficiency
  - Pheochromocytoma

The endocrine pancreas and gastrointestinal tract

- Major manifestations of disease of the endocrine pancreas
  - Spontaneous hypoglycemia
  - Disorders affecting multiple endocrine system

The hypothalamus and the pituitary gland

- Major manifestations of hypothalamic and pituitary disease
  - Hypopituitarism
  - Visual field defects
  - Galactorrhea

Hematological disorders

- Clinical examination in blood disorders
- Functional anatomy, physiology and investigations
- Major manifestations of hematological diseases
  - Anaemia
  - Polycythemia
  - Leucopenia
  - Leucocytosis
  - Thrombocytopenia
  - Thrombocytosis
  - Pancytopenia
  - Lymphadenopathy
  - Splenomegaly
  - Bleeding
  - Venous thrombosis
  - Abnormal coagulation screen
  - Infections
- Anemias
- Myeloproliferative disorders
- Haematological malignancies

- Bleeding disorders
- Disorders of coagulation and venous thrombosis
- Blood products and transfusion
- Bone marrow transplantation

Disorders of the immune system, connective tissue and joints

- Introduction to the immune system and autoimmunity
- Primary immune deficiency diseases
- HIV, AIDS and related disorders
- Major manifestations of musculoskeletal disease
  - Joint pains
  - Bone pain
  - Muscle pain and weakness
  - Regional periarticular pain
  - Back and neck pain
- Approach to articular and musculoskeletal disorders
- Inflammatory joint disease
- Infectious arthritis
- Inflammatory muscle disease
- Osteoarthritis
- Systemic connective tissue diseases - SLE, RA, PSS
- Vasculitides
- Ankylosing spondylitis, reactive arthritis and undifferentiated spondyloarthropathy
- Sarcoidosis
- Amyloidosis
- Musculoskeletal manifestations of disease in other systems
- Fibromyalgia
- Diseases of bone

Skin diseases

- Clinical examination of skin diseases
- Major manifestations of skin disease
  - Various types of rash
  - Pruritis
  - Erythroderma
  - Urticaria
  - Photosensitivity

- Blisters
- Leg ulcers
- Alopecia
- Acne

- Approach to patient with skin disease
- Some common skin infections and infestations - scabies, fungal infections, pyoderma
- Eczema, psoriasis and other erythematous scaly eruptions
- Cutaneous drug reactions
- Disorders of pigmentation
- Disorders of the nails
- Skin manifestations of systemic diseases

Neurological diseases

- Clinical examination of nervous system
- Functional anatomy, physiology and investigations
- Major manifestations of nervous system disease
  - Headache and facial pain
  - Raised intracranial tension
  - Faintness, dizziness, syncope & vertigo
  - Sleep disorders
  - Disorders of movement
  - Ataxia
  - Sensory disturbances (numbness, tingling and sensory loss)
  - Acute confusional states
  - Coma and brain death
  - Aphasias and other focal cerebral disorders
  - Speech, swallowing and brain-stem disturbance
  - Visual disturbances
  - Sphincter disturbances
- Migraine and cluster headaches
- Seizures and epilepsy
- Cerebrovascular disease
- Dementias
- Acute and chronic meningitis
- Viral encephalitis
- Diseases of cranial nerves
- Intracranial tumours

- Diseases of spinal cord
- Multiple sclerosis and other demyelinating diseases
- Parkinson's disease and other extrapyramidal disorders
- Cerebellar disorders
- Motor neuron disease
- Peripheral neuropathy
- Neurological manifestations of system diseases
- Nutritional and metabolic diseases of the nervous system
- Myasthenia gravis and other diseases of neuromuscular junction
- Diseases of muscle

TEACHING AND LEARNING METHODOLOGY

Department stress on teaching of basic fundamentals of internal medicine through various methods especially bed side teaching.

The following tools are employed:

1. Didactic lectures: discussion a particular topic at length in an one hour lecture
2. Seminars: conducted by a combined team of clinician, pathologist and microbiologist discussing a particular topic for two hours
3. Clinical training: The clinical training of undergraduate medical students occurs in four phages:
   a. 3rd semester – 21 days wards posting in 2 batches of 25 students. Each bach is divided into three groups attached to 3 medical units.

      Time: 9 a.m. – 12 noon
   b. 4th/5th semester – 50 days positing in 4 batches of about 12 students each at medical out-patient department.

      Time: 9 a.m. – 12 noon
   c. 6th semester – 40 days posting in 4 batches of about 12 students, each batch divided into three groups attached to 3 medical units.

      Time: 9 a.m. – 1 p.m.
   d. 8th semester – same as in 6th semester.
4. During medical posting undergraduates will also be asked to attend specialised department like cardiology, neurology.
5. Medical students are supposed to complete the logbook and signed by faculty after every clinical case discussion. Their logbook will be evaluated at the time of examination.

TEXT- BOOKS RECOMMENDED

1. Davidsion's Principles and Practice of Medicine, ELBS-Livingstone publications
2. Kumar & Clark' Clinical Medicine – A textbook for medical students and doctors, ELBS publications
3. Harrison's Principles of Internal Medicine, McGraw Hill publications (Reference book)
4. Oxford Textbook of Medicine Vol I & II, ELBS publication (Reference book)

5. Hutchison's Clinical Methods, ELBS publications
6. Macleod's Clinical Examination, ELBS publications
7. API textbook of Medicine

ASSESSMENT AND EXAMINATION

Statement of marks in Medicine including Psychiatry & Dermatology (Total Marks: 450) after separation from Pediatrics, effective from December, 2001.

(1) Internal Assessment

Medicine					Psychiatry			Dermatology	
III Sem	*IV/V Sem*	*VI Sem*	*VIII Sem*	*Total*	*IV/V Sem*	*VI/VIII Sem*	*Total*	*VIII Sem*	*Grand Total*
15	15	30	30	90	6	6	12	12	114

* 50% of these are added to IX semester Pre-Professional Theory & Practical Marks each.

(2) Pre-Professional Examination (IXTH Sem.)

Theory (including Viva)		Practical		Grand Total
Theory Paper-I	25	Clinical Long Case	25	
Theory Paper-II	25	Short Case	12	
Viva	6	Psychiatry	7	
		Dermatology	7	
		Viva	5	
Total	56	Total	56	112

(3) Final Examination

Theory (including Viva)		Practical		Grand Total
Theory Paper-I	50	Clinical Long Case	50	
Theory Paper-II	50	Short Case (two)	30	
Viva	12	Psychiatry	12	
		Dermatology	12	
		Spotting, X-ray, Instruments	8	
Total	112	Total	112	224

Final Professional Marks in Medicine:

	Theory	Practical	Total
Maximum Marks (I+II+III)	225.00	225.00	450.00
Minimum Marks for passing separately in Theory & Practical (50% each)	112.50	112.50	225.00

OBSTETRICS & GYNAECOLOGY

The main goal of curriculum is to enable the undergraduate students to acquire the knowledge, skills and attitudes in the discipline of Obstetrics & Gynaecology as essential for a general practitioner.

OBJECTIVES

The student should be able to:

- Make Diagnosis and organize management of antenatal, intranatal and postnatal period of normal and abnormal pregnancy;
- Provide adequate care of common gynae problems and emergencies
- Manage common gynae problems and emergencies
- Provide Counseling and delivery of fertility regulation methods.
- Acquire knowledge of methods of termination of pregnancy.
- Apply knowledge of vital statistics in obstetrics and RCH programme
- Develop communication skills.

Practical & clinical training

- Students should be trained about proper history taking, clinical examination.
- Advicing relevant necessary investigations and their interpretation and management.
- Posting in OPD, wards, operation theaters, labor room and family planning clinics.
- Students should observe common OPD procedures like, E.A., D & C, MTP, Pap Smear, CuT insertion. Observe normal deliveries, forceps and ventouse assisted deliveries, cesrean section.
- Ligations, minilap procedures like abdominal, vaginal hysterectomy, foltergill repair.

COURSE CONTENT

I Basic Sciences

1. Normal & abnormal development, structure and function of female & male urogenital systems and the female breast.

2. Applied anatomy of the genito-urinary system, abdomen, pelvis, pelvic floor, anterior abdominal wall, upper thigh (inguinal ligament, inguinal canal, vulva, rectum and anal canal).
3. Physiology of permatogenesis.
4. Endocrinology related to male and female reproduction.
5. Anatomy & Physiology of urinary & lower GI (Rectum / anal canal), tract.
6. Development, structure & function of placenta, umbilical cord & amniotic fluid.
7. Anatomical & physiological changes in female genital tract during pregnancy fistulae.
8. Anatomy of fetus, fetal growth & development, fetal physiology & fetal circulation.
9. Physiological & neuro-endocrinal changes during puberty disorders, adolescence, menstruation, ovulation, fertilization, climacteric & menopause.
10. Gametogenesis, fertilization, implantation & early development of embryo.
11. Normal pregnancy, physiological changes during pregnancy, labour & puerperium.
12. Immunology of pregnancy
13. Lactation
14. Biochemical and endocrine changes during pregnancy, including systemic changes in cardiovascular, hematological, renal, hepatic and other systems. (Anaemia)
15. Biophysical and biochemical changes in uterus and cervix during pregnancy & labour.
16. Pharmacology of identified drugs used during pregnancy, labour, post partum period with reference to their mechanism of action, absorption, distribution, excretion, metabolism, transfer of the drugs across the placenta, effect of the drugs on the fetus, their excretion through breast milk.
17. Mechanism of action, excretion, metabolism of identified drugs used in Gynaecology, including chemotherapeutic drugs.
18. Role of hormones in Obstetrics & Gynaecology.
19. Markers in Obstetric & Gynaecology – Non neoplastic and Neoplastic Diseases.
20. Pathophysiology of ovaries, fallopian tubes, uterus, cervix, vagina and external genitalia in healthy and diseased conditions.
21. Normal and abnormal pathology of placenta, umbilical cord, amniotic fluid and fetus.
22. Normal and abnormal microbiology of the genital tract – bacterial, viral & parasitic infections responsible for maternal, fetal and gynaecological disorders.
23. Humoral and cellular immunology in Obstetrics & Gynaecology.

II Obstetrics

1. Physiology of normal pregnancy, diagnosis of pregnancy, routine antenatal care, management of common symptoms in pregnancy, investigations to be carried out in pregnancy;
2. Drugs prescription during pregnancy and lactation
3. Hypertensive disorders in pregnancy
4. Anaemia in Pregnancy : Heart disease in pregnancy
5. Antepartum haemorrhage

6. Intrauterine Growth Restriction (IUGR)
7. Antenatal Fetal Surveillance
8. Rhesus Negative Pregnancy
9. Disorders of liver, kidneys in pregnancy
10. Multiple pregnancy
11. Puerperium, and its complications
12. Perinatal and maternal mortality in India

III Gynaecology

1. Anatomy of fetal genital tract, and its variations, supports of uterus, developmental anomalies of uterus.
2. Ectopic pregnancy; epidemiology, early diagnosis and management.
3. Physiology of menstruation, common menstrual problem.
4. Disorders of growth, amenorrhoeas
5. Fibroid uterus
6. Prolapse uterus
7. Vaginal discharge, sexually transmitted diseases
8. Precancerous lesions of female genital tract (cervix, vagina, vulva)
9. Carcinoma Cervix, epidemiology, staging diagnostic procedure, treatment.
10. Carcinoma Endometrium
11. Carcinoma ovary
12. Carcinoma vulva
13. Gestational Trophoblastic disease
14. Temporary and permanent methods of contraception
15. Menopause and related problems
16. Endometriosis
17. Genital Tract Fistulae
18. Adolescence, Pubertal changes, disorders of puberty

IV Contraception, Neonatology and Recent Advances

(a) Contraception (Male & Female)
(b) Medical terminal of pregnancy – safe abortion – selection of cases, technique & management of complication of medical and surgical procedures, MTP law Medical abortion & Emergency Contraception.
(c) National health programmes.
(d) Social obstetrics and vital statistics
(e) Care of new born, neonatal resuscitation, detection of neonatal malformation.

(f) Neonatal sepsis – prevention, detection & management.

(g) Neonatal hyper-bilirubinemia – investigation & management including NICU care.

(h) Managemenr of common neonatal problems

(i) Ethics and medical jurisprudence

TRAINING PROGRAMME : SCHEDULE

The undergraduate students in Obstetrics & Gynae must undergo the following rotation training during their MBBS course.

4th semester : Three weeks

6th semester : Three weeks

8th semester : Three weeks

Internship : One month

During these periods they will be posted in Obstetrics & Gynaecology OPD's Wards and OT's, Labour Room, and Family Planning OPD and OT. They will be distributed in the 3 Units of the department.

Evening tutorials during posting by senior postgraduates and senior residents.

4th semester

during this posting the students are expected to acquire competence in history taking and examination of the obstetfics and gynaecology patient.

They will be allocated beds in the wards and completed to work up these cases for case discussions with faculty. They will also attend OPD and take history of OPD cases and examine them under the suspension of commitants / senior residents. They will be posted in Minor OT to observe OPD surgical procedures like D & C, MTP, Cu-T insertion & removal, endometrial aspirations. At the end of the posting, they have to submit the records of history taking and procedures observed.

6th & 8th semester

the students are expected to gain increasing competence in making a diagnosis and planning the management of the patient. They will follow their allotted units. In addition there will be joint case discussion with the faculty by rotation.S

In OPD

They will take history and examination of ♀ pelvic organs cases under the supervision of the competent / senior resident. They will learn to draw up a list of investigations and counsel the patient and also follow them up.

Minor OT

They will assist in the performance of minor surgical procedures.

Wards

They will be allocated beds and will be responsible for working up and following their patients.

Labour Room

They will remain in the Labour Room in the evening and nights when their respective unit is on call. They will assist a minimum of 10 normal deliveries and witness 5 operative deliveries during each posting.

Main OT

They will witness / assist major surgical procedures like abdominal and vaginal hysterectomy, laparocsopic surgery.

Family Planning

Students will learn medical and surgical methods of contraception and sterilization procedure. They will learn to perform IUCD insertion and removal and minilap tubal ligation and vasectomy. They will assist 1st and 2nd trimester MTP procedure and urinary laparoscopic tubal sterilization.

Practical skills to be imparted during ward posting

Obstetrics

a. History taking and examination of a pregnancy woman
b. Watching progress of labour and conduct of a normal labour
c. Management of third stage of labour, prevention and treatment of post partum haemorrhage
d. Witness caesarean section, breech delivery, forceps and vacuum delivery
e. Essential care of a newborn
f. Non stress testing of fetus; biophysical scoring of fetus

Gynaecology

a. How to take history and examination of female pelvic organs
b. Making of pap smear, wet smear preparation on vaginal discharge
c. Minor gynaecologic procedures : cervical biopsy, endometrial biopsy, dilatation & curettage; fractional curettage
d. Medical termination of pregnancy (MTP) : in first & second trimesters
e. Insertion and removal of intrauterine contraceptive device

Operative Skills

a. Conduct of normal delivery
b. Making and repair of episiotomy
c. Insertion and removal of intrauterine device
d. Making of pap semar
e. Performing minilap tubectomy (under supervision)

Medico-Legal Responsibilities of Interns

As mentioned in the beginning of this document, Resident and Interns are advised to carefully read and

learn the medico-legal responsibilities as related to their day-to-day work in the AIIMS hospital from the AIIMS hospital "Residents' Mannual". The department of Obstetrics & Gynaecology Residents have to attend to a lot of "rape cases" in Casualty. They must be very sure of the formalities and steps involved in making the correct death certificates, mortuary slips, medico-legal entries, requisition for autopsy etc. Similarly, they must be fully aware of the ethical angle of their responsibilities and should carefully learn how to take legally valid consent for the different hospital procedure / therapics etc.

All students and interns are expected to attend the CCR and CGR.

Clinical Combined Round (CCR)

Every Tuesday at 2.30 p.m. CCR is held in LT I to discuss interesting case / procedure / surgery seen by a department. Two departments (one surgical and one medical), present, for 30 min each an interesting case / procedure with brief review of literature.

Clinical Grand Round (CGR)

This is a centralized teaching activity held at 4.00 p.m. on Tuesday in LT I where the research activity carried out by a department is presented. The total duration is one hour.

Patient care in Wards

1. Obstetric
2. Gynaecology
3. Emergency coverage or all patients with Obst/Gynae problems attending AIIMS casualty on days the unit is on call. The same unit also provides emergency consultation for the AIIMS hospital and attached centers who may require O & G Consultation during after office hours.

Patient Care in Labour Room

Labour emergency coverage is done by each unit concerned from 8 a.m. – 5 p.m. after which the emergency unit "on call" provides intensive care duty. Labour Room duty on Sunday is on rotation.

Operation Theatres

Each unit routinely has two days Main OT, 2 days Maternity OT and Interventional ultrasound OT, besides emergency OT patient care.

TEXT BOOKS RECOMMENDED

- Text book of Obstetrics for Undergraduates - V.L. Bhargava;
- Manual of Practical Obstetrics – Holland & Brews
- Shaw's Text Book of Gynaecology
- Text Book of Gynaecology – V.L. Bhargava

ASSESSMENT AND EXAMINATION

End of Posting Assessment

At the end of each clinical posting in each of the Obst & Gynae units mentioned above, the students are assessed by the faculty members. This comprises of one Obstetric case, one Gynae case and a viva

voce in obstetrics, gynaecology and family planning. In the 8th semester, a theory exam also taken at the end of the ward learning.

Pre-professional and Final MBBS Examination :

It consist of a written examination, a clinical examination to assess the clinical competencies and skills, and a viva voce examination. The final MBBS examination is conducted by two internal examiners and one external examiners. Candidates must exhibit acceptable level of competence in all the areas of knowledge, attitudes and skills being evaluated by the examiners and teaching faculty.

Written theory examination is conducted with the help of traditional essay type question papers and short notes. There is questions paper of 3 hours.

Clinical examination is aimed at assessing the clinical skills of the candidate and diagnostic reasoning. Entirely objective evaluation of these skills is neither feasible nor desirable. However, in order to test the various skills, the examiners may evaluate the candidates on a structured format, namely, history taking, physical examination, diagnostic reasoning, choice of diagnostic investigations, general management, medical and surgical procedures and strategies, and general attitude and demeanor towards the patient and the examiners. Patients material selected for examination one obstetrics and one gynae case is usually sufficiently representative of the type of patients for whom an internist may by called upon to give an opinion.

OPHTHALMOLOGY

The broad goal of undergraduate teaching in ophthalmology is to provide such knowledge and skills to the student that shall enable him/her to practice as an internist and as a primary eye care physician, and also to function effectively as a community health leader to assist in the implementation of National Programme for the Prevention of blindness.

OBJECTIVES

Knowledge

At the end of the course, the student will have knowledge of :

1. Common problems affecting the eye
2. Magnitude of blindness in India and its main causes
3. Principles of management of major ophthalmic emergencies
4. Major systemic diseases affecting the eye
5. Effect of local and systemic diseases on the patient's vision and the necessary action required to minimise the sequelae of such diseases
6. Adverse drug reactions with special reference to ophthalmic manifestations
7. National programme for prevention of blindness and its implementation at various level
8. Eye care education for prevention of eye problems
9. Role of Primary Health Centres
10. Organisation of primary health care and the functioning of the Ophthalmic assistant
11. Integration of the National programme for control of blindness with the other National health programmes
12. Eye bank organisation

Skills

At the end of the course, the student will be able to:

1. Elicit a history pertinent to general health and ocular status

2. Perform diagnostic procedures such as visual acuity testing, examination of the eye, tonometry, staining for corneal pathology, confrontation perimetry, subjective refraction including correction for presbyopia and aphakia, direct ophthalmoscopy, conjunctival smear examination and cover test
3. Diagnose and treat common problems affecting the eye
4. Interpret ophthalmic signs in relation to common systemic disorders
5. Perform therapeutic procedures such as subconjunctival injection, corneal/conjunctival foreign body removal, carbolic cautery for corneal ulcers, nasolacrimal duct syringing and tarsorraphy
6. Provide first aid in major ophthalmic emergencies
7. Organise community surveys for visual health
8. Organise primary eye care services through Primary Health Centres
9. Use effective means of communication with the public and individuals to motivate them for surgery for cataract, glaucoma etc and for eye donation
10. Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team

Teaching program

Teaching programs are regularly updated to include newer developments. As of now the program is :

Didactic lectures

Semester 5th

1. Microbiology in relation to eye
2. Pathology in relation to eye
3. Pharmacology in relation to eye
4. Symptomatology in Ocular disorders and their Pathogenesis
5. Ocular involvement in systemic diseases

Semester 6th

1. Disorders of the Lid
2. Disorders of the Lacrimal Apparatus
3. Conjunctivitis & Ophthalmia Neonatorum
4. Trachoma & Other chronic conjunctivitis
5. Keratitis and corneal ulcers
6. Corneal ulcer
7. Scleritis & Episcleritis
8. Refractive Errors & Method of correction
9. Presbyopia, accommodation convergence
10. Congenitial cataract
11. Senile cataract
12. Metabolic & complicated cataract

13. Primary Angle closure glaucoma
14. Congenitial glaucoma
15. Primary Open angle glaucoma
16. Secodary glaucomas
17. Anterior uveitis
18. Posterior uveitis
19. Blindness prevalence, prevention & rehabilitation

Semester 8th

1. Retinopathies, Hypertensive, Toxaemia & Pregnancy
2. Diabetic Retinopathy
3. Retinal Detachment, types, symptoms & pre-disposing factors
4. Endocrine ophthalmology
5. Retinal vascular disorders
6. Retinoblastoma & other ocular neoplasms
7. Binocular vision amblyopia & concomitant squint
8. Nutritional disorders
9. Incomitant strabismus
10. Visual acuity, pupillary path ways & cranial nerve palsies
11. Optic nerve lesions
12. Ocular emergencies (Traumatic)
13. Ocular emergencies (Non-Traumatic)
14. Minor ophthalmic surgery
15. General principles of Intra ocular surgery
16. National programme for control of blindness
17. Comprehensive eye care in rural set up
18. Eye banking & ethics in ophthalmology

Clinical ward teaching

1. Trachoma
2. Entropion / ectropion
3. Pterygium
4. NLD block / Dacryocystitis
5. Conjunctivitis / allergic / acute
6. Corneal ulcer
7. Keratitis
8. Iridocyditis
9. Angle closure glaucoma
10. Scleritis / episcleritis

11. Dark room
12. Refractive errors & presbyopia
13. Cataract – senile
    a. Complicated
    b. Post operative
    c. Complications
    d. Intraocular lenses
14. Basic sciences (Microbiology, Pharmacology, Pathology)
15. Investigative lab. I
16. Investigative lab. II
17. Casualty & minor O.T. I
18. Casualty & minor O. T. II
19. Open angle glaucoma
20. Xerophthalmia
21. Corneal opacities
22. Ocular injury
23. Perforating / concussional injuries
24. Amaurosis fugax
25. Diabetic retinopathy
26. Hypertensive retinopathy
27. Anemic and other retinopathies
28. Indirect ophthalmoscopy
29. Orthoptics
30. Concomitant squint
31. Paralytic squint
32. Surgical Instruments
33. Main O.T. I
34. Main O.T. II
35. Main O.T. III

LIST OF BOOKS

1. Parson's diseases of the Eye, 19th Edition.
2. Clinical Ophthalmology – Kanski.

ASSESSMENT AND EXAMINATION

The final professional MBBS examination at A.I.I.M.S., New Delhi is held at the end of the last two academic years (4 academic semesters) of undergraduation in the following subjects:

(a) Medical Disciplines

(b) Surgical Disciplines

(c) Community Medicine

(d) Obstetrics & Gynaecology

At the undergraduate level, Ophthalmology is considered a subspeciality of surgery. The assessment in Ophthalmology is therefore conducted along with the Surgery examination. Assessment in Community Ophthalmology is held along with the speciality of Community Medicine.

The certifying assessment in Ophthalmology, as in other branches, comprises both an ongoing continuous formative assessment and the final examination (summative assessment). 50% of the total marks are allocated for formative assessment while the other 50% of the total marks are allocated for summative assessment. The students' cognitive knowledge as well as their clinical skills are assessed separately using different assessment techniques (i.e. a theoretical examination for assessment of cognitive skills and a practical examination and viva voce for examination of clinical skills). The candidate has to pass separately in theory as well as in the practical examination.

THE FINAL EXAMINATION (SUMMATIVE ASSESSMENT)

Ophthalmology is evaluated (as mentioned previously) both as part of the surgical disciplines and as a part of Community Medicine. Marks are allocated for both the theoretical aspects (cognitive skills) and practical examination (psychomotor skills) in both these disciplines. The details of the assessment of cognitive skills in Ophthalmology, both as part of the Surgical disciplines and as part of Community Medicine are given below:

Assessment of Cognitive Skills

Surgical Disciplines : The theoretical examination in the surgical disciplines comprises two Theory Papers of 60 marks each for assessment of cognitive skills.

Paper II : has two parts

Part A : Which comprises General Surgery and specialities (traumatic surgery). Orthopaedic surgery and anaesthesiology are also included in this paper.

Part B : Which comprises Ophthalmology and Otorhinolaryngology (with weightage in the proportion of 2:1).

The questions in paper II are set and evaluated by the internal examiners who may be Professors/ Additional Professors/ Associate Professors or Assistant Professors in these specialities with a minimum of 3 years' experience at the Institute.

Part B of Surgery paper II is allotted 30 marks of which 20 marks are allocated for Ophthalmology and 10 for Otorhinolaryngology (i.e. ratio of 2:1). The Ophthalmology paper generally has two questions, one of which is an essay type question and another which consists of 2-3 short notes. In addition to assessment as part of the Surgery disciplines, the theoretical examination in Ophthalmology is also assessed in the theory paper of Community Medicine.

Community Medicine: Community Medicine has two theory papers.

Paper I : This deals with Community Medicine in general including Demography, Ecology, Epidemiology etc.

Paper II : This includes application of Preventive and Social Medicine to the clinical disciplines. The clinical disciplines included are Obstetrics and Gynaecology, Ophthalmology, Paediatrics, Psychiatry and Surgery. A question on Community Ophthalmology is included in the form of an essay type question for short notes of 15 marks.

Viva Voce Examination

Marks are also allocated for the Viva Voce Examination in Ophthalmology in both the Surgical disciplines and in Community Medicine. These are included in the theory paper though the examination is carried out along with the practical examination. There are 10 marks for Viva Voce examination in Ophthalmology in the General Surgery discipline and another 10 marks in Community Medicine theoretical examination. Thus a total of 20 marks are allotted for the Viva Voce examination in Ophthalmology as part of the Theory paper in the MBBS Final Professional examination.

Examination of Psychomotor skills (Practical examination)

Just as the cognitive skills in Ophthalmology are assessed alongwith the Surgical disciplines and Community Medicine as described in the section on Examination on Cognitive skills (Theoretical examination), so also the Psychomotor skills in Ophthalmology are evaluated in the practical examination as part of both the Surgical disciplines and Community Medicine.

Surgical Disciplines : Out of the total 150 marks for practical examination in Surgical disciplines, 30 marks are allocated for the Ophthalmology practical examination. The Ophthalmology practical examination comprises the following:

a)	Clinical case discussion	20 marks
b)	Dark room procedure	5 marks
c)	Instruments	5 marks
	Total	30 marks

Community Medicine : The practical examination is carried out at Ballabhgarh, at the Comprehensive Rural Health Services Project of A.I.I.M.S., New Delhi. Out of the total of 150 marks for practical examination in Community Medicine, 50 marks are allotted to the clinical specialities of Ophthalmology, Obstetrics and Gynaecology, Paediatrics, Psychiatry and Surgery. The student is allotted a case of some important community problem in each of these specialities. The student is then evaluated independently by examiners from each speciality (10 marks for each subject).

FORMATIVE ASSESSMENT (INTERNAL ASSESSMENT)

50% of the total marks in the Final professional examination are allotted for Internal assessment, which comprises both theory and practical examinations. Of these marks, 25% are allotted for the Pre-professional examination held a month or two before the Final professional examination and the other 25% of the marks are allotted for Internal assessment carried out after each posting in a subject. There are 15 marks for the theory examination and 15 marks for the Practical examination in Ophthalmology in the Pre-professional examination. A similar number of marks are allotted for the Internal assessment at the end of the Ophthalmology clinical posting in the 6th or 8th semester.

The theory paper for the Internal assessment carried out at the end of the 6th or 8th semester (for different batches) is set in the form of essay type questions or short answer questions. The practical examination is being carried out by Objective Structured Clinical Examination (OSCE) consisting of 10-15 stations for the past one and a half years. The methodology for conduction of OSCE is given in detail elsewhere in this book. The pattern of the Pre-professional examination in Ophthalmology is similar to that described for the Final professional examination in all respects except that the weightage is 25% of the total marks (as compared to 50% for the final professional examination).

The Internal assessment in Community Ophthalmology is carried out along with Community Medicine during the Pre-professional examination. There is no End semester assessment in Community

Ophthalmology. The Theory and Practical examination are allotted 15 and 10 marks respectively. The Theory paper consists of either an essay type question or short notes. The practical examination is in the form of a long case and its subsequent discussion.

The details of the various components of the theoretical and practical examination in Ophthalmology at the Undergraduate level are summarised in the form of a table (Table I) for clarity.

TABLE I Weightage given to Ophthalmology during Assessment of Undergraduates (Final Professional Examination).

	Final Examination				**Internal Assessment**				**Total**
Subject Score	Theory	Practical	Viva	Total	Theory	Practical	Viva	Total	
Surgical Special Total marks (600)	20	30	10	60	20	30	10	60	120
Community Medicine Total marks (600)	15	10	-	25	15	10	-	25	50

APPENDIX I

SAMPLE QUESTION PAPER OF SURGERY PAPER II
ALL INDIA INSTITUTE OF MEDICAL SCIENCES
FINAL MBBS EXAMINATION

Time allowed – 3 hours Max Marks : 60

Answer each part in separate books:

Part II (Ophthalmology)

1. Write briefly the differential diagnosis of acute red eye. Discuss in detail the management of bacterial corneal ulcer. (10)
2. Write short notes on: 10 (5 × 2)

   a) Pterygium b) Presbyopia

SAMPLE QUESTION PAPER ON COMMUNITY MEDICINE PAPER II
ALL INDIA INSTITUTE OF MEDICAL SCIENCES
FINAL MBBS EXAMINATION

Time allowed – 3 hours Max Marks : 75

Answer each part in separate SHEETS:

Part II (Ophthalmology)

1. Classify the ocular involvement in Vitamin A deficiency. Describe ocular signs of Vitamin A deficiency and discuss their management. (15)

ORTHOPAEDICS

An MBBS student should know about the commonly encountered conditions in orthopaedics pertaining to their diagnostic features, basic patholophysiological aspect and the general and basic management strategies. It is expected to learn basic skills such as application of splints, skin and skeletal traction, as well as plaster slab and casts (including special casts such as CTEV cast, hip spica, shoulder spica, cylinder cast, patellar tendon bearing casts).

An MBBS student should know the maneuvers for reduction of common fractures and dislocations such as colles' fracture, supracondylar fracture of humerus, dislocation of shoulder, elbow and hip etc.

OBJECTIVES

1. Embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the principles of therapeutics including preventive methods, (medical/surgical) pertaining to musculo-skeletal system.
2. Clinical decision making ability & management expertise: Diagnose conditions from history taking, clinical evaluation and investigations and should be able to distinguish the traumatic from infective and neoplastic disorders.
3. Thrust areas
    a) Pediatric orthopaedics- The student should be exposed to common congenital and developmental disorders such as CTEV (club-Foot), developmental dysplasia of hip, Perthe's disease and infections, and also should acquire adequate knowledge about the principles of management of these disorders.
    b) Orthopaedic oncology- The undergraduate is expected to be familiar with the common tumours encountered in orthopaedic practice. The student should be able to diagnose common bone tumors and should know principles of treatment
    c) Management of Trauma- Trauma in this country is one of the main causes of morbidity and mortality in our demographic statistics. The student is expected to be fully conversant with trauma in its entirety including basic life saving skills, control of hemorrhage, splintage of musculoskeletal injuries and care of the injured spine.
    d) Sports Medicine- The student should know about common orthopaedic pathologies encountered in sportspersons and their diagnostic and preventive aspects.

e) Physical Medicine and Rehabilitation- The student is expected to be familiar with common orthotic and prosthetic devices and their applications.

f) Orthopedic Neurology- The student should be exposed to all kinds of nerve injuries as regards their recognition & principles of management, cerebral palsy and acquired neurologic conditions such as post polio residual paralysis.

g) Disorders of Spine - The student is expected to be familiar with various kinds of spinal disorders such as scoliosis, kypho-scoliosis, spinal trauma, prolapsed intervertebral disc and infections (tuberculosis and pyogenic) as regards their clinical presentations and principles of management.

h) Radiology- Acquire knowledge about radiology/imaging and should be able to interpret radiographs typical of common orthopaedic pathologies.

4. Patient doctor relation: UG should learn the skills to communicate with the patient and his/her relatives pertaining to the disease condition, its severity and options available for the treatment/ therapy.

5. Preventive Aspect: Undergraduate should acquire knowledge about prevention of some conditions especially in children such as poliomyelitis, congenital deformities, cerebral palsy and common orthopaedic malignancies.

TEACHING LEARNING ACTIVITIES

Didactic Lectures

UG will attend didactic lectures on the following topics.

· Fracture:Definition, Classification, Principles of Management
· Fracture healing, delayed union
· Classification & Management of open fractures
· Management of fracture calvicle, dislocation shoulder &
· fracture shaft humerus
· Classificaton of injuries around elbow & management of
· supracondylar fracture & dislocation of elbow
· Monteggia fracture dislocation & fracture both bones of forearm
· Volkamann’s Ischaemic Contracture
· Fracture of lower end of radius fracture scaphoid and metacarpals
· Fracture pelvis & dislocation of hip
· Fracture neck of femur
· Fracture shaft of femur & tibia
· Internal Derangements of Knee, Injuries of ankle & foot
· Amputations
· Congenital malformations: CTEV Torticollis
· Congenital Malformation : CDH, Pseudoarthrosis tibia etc.
· Disorders of the hip : coxa vara, perthes diseases
· Deformities of the spine

- Acute Pyogenic Ostyeomyelitis
- Chronic Pyogenic Osteomyelities
- Septic Arthritis
- Other Arthritides (Rheumatoid/Ank.Spond.)
- Osteo-articular tuberculosis:
- General consideration & principles of management
- Tuberculosis: Spine
- Poliomyelitis
- Bone Tumours: Benign tumors
- Bone Tumours: Malignant tumors

Integrated Seminars – Combined interdisciplinary seminars on subjects like Arthritis, Tuberculosis, Osteoporosis etc.

ACQUISITION OF BASIC ORTHOPAEDIC SKILLS

The undergraduate learns:

- Application of splints and tractions
- Application of plaster. Slabs and casts
- Manipulative reduction of common fractures and dislocations.
- Infiltration of tender periarticular lesions.
- Aseptic technique of joint fluid aspiration.

DURATION OF TRAINING AND ROTATION PROGRAMMES (WARD/OT/OPD):

- Spends 6 (six) hours in orientation programme in the ward/OPD in the third semester. Learns basic orthopedic examination skills and bedside manners.
- Spends 3 weeks in the department in the seventh semester.During this period he/she
  - Learns bedside history taking in ward, OT exposures and casualty.
  - Examine indoor (medical; preoperative and postoperative) patients learn examination, principles of treatment and techniques of traction would care and splintage
  - Attends OPD, operation theatre and emergency operations for acclimatization.
  - Attends ward rounds.
  - Participates in the teaching sessions in ward for bedside clinical in the weekly afternoon seminar/ journal club.
  - Attends the weekly Journal Club and seminar.
  - Attends scoliosis, polio, hand, CTEV and arthritis clinics.
  - Surgicopathological conference in Pathology Department, with surgeons.

SPECIFIC ACTIVITIES IN DETAIL

1. Case presentation in the ward and the afternoon special clinics (such as scoliosis/Hand clinics). UG will present a clinical case for discussion before a faculty in the ward every morning.

2. Case Conference- Undergraduate will attend case conference on every Monday afternoon where the Residents are expected to work-up one long case and three short cases and present the same to a faculty member and discuss the management in its entirety.
3. X-Ray Classes- UG should attend x-ray classes held twice weekly in morning in which the radiologic features of various problems are discussed.
4. Surgicopathological Conference: UG should attend period surgicopathology conferences in which special emphasis is made on the surgical pathology and the radiological aspect of the case in the pathology department.
5. UG should attend, during their posting, the following Afternoon clinics:

   Scoliosis Clinic- Held once a week. Residents work up the cases of spinal deformity and present them to a faculty member and management plan recorded in case file.

   Hand Clinic- Held once a week. All the cases of hand disorders are referred to the clinic and discussed in detail.

   CTEV Clinic- Held once a week. Corrective casts are given and the technique learnt by the residents and the undergraduates. Surgical management in also planned & recorded in case file.

   Polio Clinic- Held once a week. Various braces & Calipers are prescribed and surgical management planned.
6. Besides clinical training for patient care management and for bed side manners:

   Clinical training daily for 2½ to 3 hours in the morning in the ward with faculty and 1-2 hours in the evening by senior resident/faculty on emergency duty; bed side patient care discussions are to be made.
7. Clinical teaching:

   In OPD, ward rounds, emergency and the operation theatres:

   By Residents/Senior Residents and Faculty on duty in respective places – make discussion on clinical diagnosis/surgical procedures/treatment modalities, including postoperative care and preparation of discharge slip.

TEXT BOOKS RECOMMENDED

Title of the book	Author	Publisher
Outlines of Fractures	Crawford Adams	Churchill Livingstone
Closed Treatment of Fractures	H.John Charnley	Churchill Livingstone
Outlines of Orthopaedics	Crawford Adams	Churchill Livingstone

ASSESSMENT AND EXAMINATION

Assessment will be done at the end of posting and the marks will be added to internal assessment for surgical disciplines.

The oral, clinical and Practical Examination at the end of 3 weeks' ward posting:

(a) Clinical Patient presentation/discussion:

(i) The case will be structured comprising – history taking, clinical examination, investigations, decision making, proposed treatment modalities, ethical justification and personal attributes.

(b) Reading X-rays, identification of Instruments & discussion, identification of braces & calipers.

Final Examinations

Undergraduates is assessed for orthopaedics in the preprofessional and professional examinations.

(a) The theory paper consists of 3-4 short notes in the Surgery (Paper-II)

comprising of the 25% of the total marks for the Surgery theory (Paper-II).

The syllabus for the theory paper is as outlined above.

(b) The practical assessment is on the lines of the assessment done at the end of the clinical posting. A senior faculty member coordinates with the internal examiners of surgical disciplines and conducts the examinations.

Schedule of Teaching and Posting

I. Orientation program: in ward

(3rd Semester 6-9 hours)

II. DISCIPLINE TRAINING (Duration – 3 weeks)

- Ward class with faculty (Teaching)
- OPD – Case base learning & Patient care
- Demonstration of operative procedures in OT & Trauma Management in causality
- Case-presentation/discussion (Afternoon special clinics)
- Seminar weekly
- Surgicopathological conference – held monthly
- Radiology Conference – weekly

OTORHINOLARYNGOLOGY

During under graduate course, the students should learn the principles of examination and management of common Ear , Nose and throat diseases and acquire adequate skills to manage common diseases like CSOM ‘tonsillitis common emergencies like upper airway obstruction and peritonsillar abscessand be able to refer the complicated cases to an appropriate specialist

OBJECTIVES

At the end of the otorhinolaryngology posting. The student shall be able to

1. Examine and diagnosis common ear, nose, and throat problems
2. Suggest common investigative procedures and their intepretation to diagnose and manage the patient.
3. Treat the common ear, nose, throat and neck problem at primary care centre, while treating the patient. He should know the rational use of commonly used design with their adverse effects.
4. Train to perform various minor surgical procedures like ear syringing nasal packing and biopsy procedure.
5. Assist common surgical procedures such as tonsillectomy, mastoidectomy, septoplasty, tracheostomy and endoscopic removal of foreign bodies.
6. Have awareness of Preventive otology and head & neck cancer for public guidance.

Clinical Training : The students would be posted in the ENT department **(** OPD and Ward) for a total period of 2 months on rotation basis . Here they would learn the basic ENT examination, become familirised with diagnosing the common ENT diseases and learning the elementary management, including communication skills.

The clinical training would consist of

1) two classes on introduction to the clinical aspects of ENT including proper Ear , Nose and throat examination
2) Bed side teaching and case discussion on common ENT conditions like CSOM, Deviated Nasal septum, Nasal polyps, Cancer larynx etc
3) Orientation to commonly used ENT instruments and X-Rays in ENT practice

4) Exposure to commonly done OPD procedures like nasal packing , ear packing, cautery etc
5) Exposure to selective operative procedures like tracheostomy, tonsillectomy , septoplasty, Nasal polypectomy etc
6) Preventive Otology and head & neck cancer.

Theory

The formal lecture scheduele for the MBBS students would be held in the 6th and 8th semesters and would consists of 1 hour lectures.

Scheduele for 6th semester

1. Introduction to Ear, Nose, Throat and Head & Neck Surgery.
2. Acute and chronic Rhino sinusitis, Nasal polyp Fungal disease of Nose.
3. Secretary Otitis Media, Acute suppurative otitis media. Acute mastoiditis and its treatment.
4. Classification of CSOM, pathogenesis of cholesteatoma. Conservative management of CSOM, underlying principles of myringoplasty, ossiculoplasty, tympanoplasty, radical and modified mastoidectomy.
5. Complications of CSOM and their management.
6. Otospongiosis, tympanosclerosis, adhesive otitis media. Prevention of deafness.Voice and speech disorders including stammering.
7. Epistaxis: causes and management. Principles of management in maxillofacial trauma. Maxillary and Nasal bone fractures. CSF Rhinorrhoea.
8. Lesions of the nasal septum-perforation, haematoma, DNS, nasal deformitis and their management, including rhinoplasty, choanal atresia.
9. Benign and malignant tumours of the maxilla – diagnosis and management. Differential diagnosis and management of a maxillary swelling and of a mass in the nasal cavity.

Schedule for 7th Semester students session

1. Causes of facial paralysis and their management. Tumours of temporal bone acoustic neuroma, glomus Jugulare.
2 Clinical evaluation of vertigo
3. Rhinitis, rhinosporidiosis rhinoscleroma, midline granuloma, Wegener's granulomatosis, leprosy and tuberculosis of nose.
4. Anatomy of neck spaces. Tumours and infections of retropharyngeal space and parapharyngeal spaces. Ludwig's angina. Neurological disorders of the larynx.

COURSE CONTENT

Nose: Deviated nasal septus, nasal polypi, angiofibroma. Tumours both benign and malignant, chronic granulomatous disease? Nose like rhinospondiosis and atrophic rhinitis.

Oral cavity and oropharynx

Tonsillitis, leukoplakia, carcinoma apthocu ulcers, pharyngitis, peritonsilla abscess, candidiasis.

Ear

Perichondritis, coax, otitis externa, secretary, otitis media, acute suppuratin otitis media, chronic supputatin otitis media (safe and unsafe), benign and malignant tumors of ear, larynx, vocal cord nodule, vocal polyp, carcinoma, vocal cord palsy.

Hypopharynx : Benign and malignant disease.

Neck : Lymphadenitis, metastatic neck benign and malignant tumors of neck, broncheal sinus, branchially pyroid tumors, salvary gland tumors.

Emergencies : Respiratory obstruction foreign bodies in nose, ear, throat, trachobroncheal tree and esophagus nasal bleeding, trauma to neck.

Instruments

- Thudicum nasal speculum.
- Killiani self retaining nasal speculum
- Tielley lichwitz antrum puncture trocar and cannula
- Higginson's rubber syringe
- Ballenger's swivet knife
- Walsham's forceps
- Luis forceps
- Tilleys forceps
- St clair thomson post nasal mirror
- Simpson's antral syringe
- Jobson hornes probe and ring curette
- Siegle pneumatic speculum
- Tuning fork
- Barany noise box
- Head mirror
- Toynbee ear speculum
- Boyle Davis mouth gag
- Lack's tongue depressor
- Draffins bipod metallic stand
- Eve's tonsillar snare
- St Clare Thomson Adenoid curette with / without cage
- Trousseau's trocheal dilator
- Jackson's metallic tracheostomy tube
- Direct laryngoscope
- Chevalier Jackson's oesophagoscope
- Negus bronchoscope

Operative Procedures

- Tonsillectomy
- Adenoidectomy
- Septoplasy
- Caldwell-Luc operation
- Myringoplasty
- Modified radical mastoidectomy
- Radical mastoidectomy
- Biopsy for diagnosis of carcinoma of tongue, etc
- Direct larygnoscopy
- Neck node biopsy

X-ray

- X-ray paranasal sinus
  Water's view
  Caldwell view
  Lateral view
- X-ray nasopharynx – lateral view
- X-ray mastoid
  Oblique lateral view
  Town's view
- X-ray neck
  Lateral view
  Anteroposterior view

SUGGESTED BOOKS

1) Logan Turner; Text Book of ENT
2) Scott Brown's Otolaryngology - 5 volumes
3) P.L Dhingra ; Text book of ENT

ASSESEMENT AND EXAMINATION

1) Formative ; Total weightage 75%. This would be during the course of the student's posting . This would include weekly assessment and a final assessment at the end of their posting
2) Summative; Total weightage 25%At the time of the final Professional exam and would be of 25 marks of which 15 marks would be for clinical test and 10 marks for theory test.

PEDIATRICS

The course includes systematic instructions in growth and development, nutritional needs of a child, immunization schedules and management of common diseases of infancy and childhood, scope of Social Pediatrics and counselling.

OBJECTIVES

The broad goals of the teaching of undergraduate students in Pediatrics are to acquire knowledge and appropriate skills for optimally dealing with major health problems of children and to ensure their optimal growth and development.

Knowledge

At the end of the course, the student shall be able to:

(a) Describe the normal growth and development during fetal life, neonatal period, childhood and adolescence and outline deviations thereof;

(b) Describe the common pediatrics disorder and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation;

(c) State age related requirements of calories, nutrients, fluids, drugs etc. in health and disease;

(d) Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse;

(e) Outline national programmes relating to child health including immunization programmes;

Skills

At the end of the course, the student shall be able to:

(a) Take a detailed pediatrics history, conduct an appropriate physical examination of children including neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigations and plan and institute therapy;

(b) Take anthropometric measurements, resuscitate newborn infants with bag and mask at birth, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current national programmes, start an intravenous line and provide naso-gastric feeding, observe venesection and

intra-osseous infusion if possible.

(c) Conduct diagnostic procedures such as lumbar puncture, bone marrow aspiration, pleural tap and ascitic tap; observe liver and kidney biopsy.

(d) Distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies including care of pre-term and low birth weight babies, provide correct guidance and counselling in breast-feeding.

(e) Provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

Integration

The training in pediatrics should be done in an integrated manner with other disciplines, such as Anatomy, Physiology, Forensic Medicine, Community Medicine, Obstetrics and Physical Medicine, curative and rehabilitative services for care of children both in the community and at hospital as part of a team.

COURSE CONTENT

Vital statistics

- Definition and overview of Pediatrics with special reference to age-related disorders. Population structure, pattern of morbidity and mortality in children.
- Maternal, perinatal, neonatal, infant and preschool mortality rates. Definition, causes, present status and measures for attainment of goals.
- Current National programmes such as ICDS, RCH, Vitamin A prophylaxis, UIP, Pulse polio, AFP, ARI, Diarrhea control programme etc., IMCI
- Other National Programmes

Growth and development

- Normal growth from conception to maturity.
- Anthropometry – measurement and interpretation of weight, length/height, head circumference, mid-arm circumference. Use of weighing machines, infantometer
- Interpretation of Growth Charts: Road to Health card and percentile growth curves.
- Abnormal growth patterns – failure to thrive, short stature.
- Growth pattern of different organ systems such as lymphoid, brain and sex organs.
- Normal pattern of teeth eruption.
- Principles of normal development
- Important milestones in infancy and early childhood in the areas of Gross Motor, Fine Motor, Language and Personal–Social development. 3-4 milestones in each of the developmental fields, age of normal appearance and the upper age of normal psychological and behavioral problems.
- Measurement and interpretation of sitting height, US: LS ratio and arm span.
- Age-independent anthropometric measurement-principles and application.

Nutrition

- Normal requirements of protein, carbohydrates, fats, minerals and vitamins for newborn, children

and pregnant and lactating mother. Common food sources.

- Breast feeding, physiology and lactation, composition of breast milk, Colostrum, Initiation and technique of feeding. Exclusive breast milk. Hazards and demerits of prelacteal feed, top milk and bottle-feeding. Feeding of LBW babies.
- Infant feeding/weaning foods, method of weaning.
- Assessment of nutritional status of a child based on history and physical examination.
- Protein energy malnutrition-Definition, classification according to IAP/Wellcome Trust, acute versus chronic malnutrition. Clinical features of Marasmus & kwashiorkar. Causes and management of PEM including that of complications planning a diet for PEM.
- Vitamins-Recognition of vitamin deficiencies (A, D, K, C, B Complex). Etiopathogenesis, clinical feature, biochemical and radiological findings, differential diagnosis an management of nutritional rickets & scurvy. Hypervitaminosis A and D.
- Characteristics of transitional and mature milk (foremilk & hind milk). Prevention and management of lactation failure and feeding problems.
- Definition, causes and management of obesity.

Immunization

- National Immunization Programme.
- Principles of Immunization. Vaccine preservation and cold-chain.
- Types, contents, efficacy storage, dose, site, route, contra-indications and adverse reactions of vaccines – BCG, DPT, OPV, Measles, MMR and Typhoid: Rationale and methodology of Pulse Polio Immunization.
- Investigation and reporting of vaccine preventable diseases. AFP (Acute Flaccid Paralysis) surveillance
- Special vaccines like Hepatitis B, H influenza B, Pneumococcal, Hepatitis A, Chicken pox, Meningococcal, and Rabies.

Infectious diseases

- Epidemiology, basic pathology, natural history, symptoms, signs, complications, investigations, differential diagnosis, management and prevention of common bacterial, viral and parasitic infections in the region, with special reference to vaccine-preventable disease: Diarrhea, LRTI, Tuberculosis, Poliomyelitis, Meningitis, Diphtheria, Whooping cough, Tetanus including neonatal tetanus, Measles, Mumps, Rubella, Typhoid, Viral Hepatitis, Cholera, Chickenpox, Giardiasis, Amoebiasis, Intestinal helminthiasis, Malaria, Dengue fever, AIDS.
- Kala-Azar, Leprosy, Chlamydia infection

Hematology

- Causes of anemia in childhood. Classification based on etiology and morphology.
- Epidemiology, recognition, diagnosis, management and prevention of nutritional anemia-iron deficiency, megaloblastic.
- Clinical approach to a child with anemia with lymphadenopathy and/or hepato-splenomegaly.
- Epidemiology, clinical features, investigations and management of Thalassemia.
- Approach to a bleeding child.

- Diagnosis of acute lymphoblastic leukemia and principles of treatment.
- Clinical features and management of hemophilia, ITP.
- Diagnosis and principles of management of lymphomas.
- Types, clinical features and management of acute hemolytic anemia.
- Non-thrombocytopenic purpura (Henoch-Schonlein purpura)

Respiratory system

- Clinical approach to a child with cyanosis, respiratory distress, wheezing. Significance of recession, retraction.
- Etiopathogenesis, clinical features, complications, investigations, differential diagnosis and management of acute upper respiratory infections, pneumonia with emphasis on bronchopneumonia, bronchiolitis, bronchitis. Acute and chronic otitis media.
- Etiopathogenesis, clinical features, diagnosis, classification and management of bronchial asthma. Treatment of acute severe asthma.
- Pulmonary tuberculosis-tuberculous infection versus tuberculous disease, difference between primary and post-primary tuberculosis. Etiopathogenesis, diagnostic criteria in children versus adults. Diagnostic aids-technique and interpretation of Mantoux test and BCG test. Radiological patterns, Chemoprophylaxis and treatment.
- Diagnosis and management of foreign body aspiration. Differential diagnosis of stridor.
- Pathogenesis, clinical features and management of pneumothorax, pleural effusion and empyema.
- Multidrug resistant tuberculosis, Bronchiectasis, pulmonary cysts

Gastro Intestinal Tract

- Clinical approach to a child with jaundice, vomiting, abdominal pain, upper and lower GI bleeding, hepato-splenomegaly.
- Acute diarrheal disease-Etiopathogenesis, Clinical differentiation of watery and invasive diarrhea, complications of diarrheal illness. Assessment f dehydration, treatment at home and in hospital. Fluid and electrolyte management. Oral rehydration, composition of ORS.
- Persistent and chronic diarrhea
- Clinical features and management of acute viral hepatitis and acute liver failure, causes & diagnosis of Chronic Liver Disease.
- Neonatal cholestasis, portal hypertension
- Common causes of constipation.
- Abdominal tuberculosis.
- Causes, clinical features and management of Portal hypertension, Reye's syndrome, Celiac disease.
- Drug induced hepatitis

Central Nervous System

- Evaluation of milestones and developmental age
- Localization of neurological deficit
- Clinical approach to a child with coma, mental retardation

- Common causes and approach to convulsion
- Clinical diagnosis, investigations and treatment of acute pyogenic meningitis, encephalitis & Tubercular Meningitis, Cerebral Malaria
- Seizure Disorder-Causes and types of convulsions at different ages. Diagnosis categorization & management of Epilepsy (Broad outline). Febrile convulsions-definition, types Management of seizures and status epilepticus.
- Causes, diagnosis and management of cerebral palsy.
- Acute flaccid paralysis – Differentiation between Polio and Guillain – Barre syndrome.
- Microcephaly, Hydrocephalus, chorea
- Counseling parents for inherited neurological diseases
- Infantile tremor syndrome, infantile hemiplegia

Cardiovascular system

- Clinical features, diagnosis, investigation, treatment and prevention of acute rheumatic fever. Common forms of rheumatic heart disease in childhood. Differentiation between rheumatic and rheumatoid arthritis.
- Recognition of congenital acyanotic and cyanotic heart disease. Hemodynamics, clinical features and management of VSD, PDA, ASD and Fallot's tetralogy (Cyanotic spells).
- Recognition of congestive cardiac failure in children.
- Hypertension in children-recognition and referral.
- Diagnosis and management of bacterial endocarditis, pericardial effusion, myocarditis.

Genito-Urinary system

- Basic etiopathogenesis, clinical features, diagnosis, complications and management of acute post-streptococcal glomerulo-nephritis and nephrotic syndrome.
- Etiology, clinical feature, diagnosis and management of urinary tract infection – acute and recurrent.
- Etiology, diagnosis and principles of management of acute failure.
- Causes and diagnosis of obstructive uropathy in children.
- Diagnosis and principles of management of chronic renal failure.
- Causes and diagnosis of hematuria.
- Renal and bladder stones
- Hemolytic-uremic syndrome

Endocrinology

- Etiology clinical features & diagnosis of diabetes and hypothyroidism, hyperthyroidism and goiter in children.
- Delayed and precocious puberty

Neonatology

- Definition – live birth, neonatal period, classification according to weight and gestation, mortality rates.

- Delivery room management including neonatal resuscitation and temperature control
- Etiology, clinical features, principles of management and prevention of birth asphyxia.
- Birth injuries – causes and their recognition.
- Care of the normal newborn in the first week of life. Normal variations and clinical signs in the neonate.
- Breast feeding-physiology and its clinical management
- Identification of congenital anomalies at birth with special reference to anorectal anomalies, tracheo-esophageal fistula, diaphragmatic hernias, neural tube defects.
- Neonatal Jaundice: causes, diagnosis and principles of management.
- Neonatal infection– etiology, diagnosis, principles of management. Superficial infections, sepsis.
- Low birth weight babies-causes of prematurity and small-for-date baby, clinical features and differentiation. Principles of feeding and temperature regulation. Problems of low birth weight babies.
- Identification of sick newborn (i.e. detection of abnormal signs – cyanosis, jaundice, respiratory distress, bleeding, seizures, refusal to feed, abdominal distension, failure to pass meconium and urine)
- Recognition and management of specific neonatal problems-hypoglycemia, hypocalcemia, anemia, seizures, necrotizing enterocolitis, hemorrhage
- Common intra-uterine infections
- Transportation of a sick neonate.

Pediatrics Emergencies

- Status epilepticus
- Status asthmaticus/Acute Severe Asthma
- Shock and anaphylaxis.
- Burns
- Hypertensive emergencies.
- Gastrointestinal bleed.
- Comatose child
- Congestive cardiac failure
- Acute renal failure

Fluid-Electrolyte

- Principles of fluid and electrolyte therapy in children
- Pathophysiology of acid-base imbalance and principle of management

Genetics

- Principles of inheritance and diagnosis of genetic disorders
- Down’s syndrome

Behavioral Problems

- Breath holding spells, nocturnal enuresis, temper tantrums, pica

Pediatrics Surgical Problems

- Diagnosis and timing of surgery of Cleft lip/palate, hypospadias, undescended testis, tracheo-esophageal fistula, hydrocephalus, CTEV, Umbilical and inguinal hernia, malformations, hypertrophic pyloric stenosis.

Therapeutics

- Pediatric doses, drug combinations, drug interactions, age specific choice of antibiotics.

TEACHING AND LEARNING ACTIVITIES

Teaching in the department will include didactic lectures and practical training.

Didactic Lectures

1. Introduction to child health and age related influences on child health
2. Growth: Principles, Normal pattern, clinical indices and use of growth charts
3. Growth: Abnormal, etiology and approach to management
4. Development: Principles and normal milestones
5. Abnormal development: etiology and management
6. Protein energy malnutrition: Etiology, classification, clinical features, management
7. Clinical aspects of fluid and electrolyte balance in children
8. Common vaccines: doses, schedule, contraindications and side effects
9. Approach to a child with shock
10. Approach to a child with acute fever
11. Deficiency disorders of vitamins and micro-nutrients
12. Approach to a child with acute diarrhea, dehydration and ORS
13. Persistent diarrhea: etiology, clinical features and management. Dietary therapy in chronic diarrhea
14. Approach to management of common abdominal symptoms -pain, vomiting, constipation, rectal bleeding etc
15. Approach to a child with upper respiratory tract infection (LTB, epiglottitis, otitis media, cough and cold)
16. Approach to a child with lower respiratory infection (pneumonia, bronchiolitis)
17. Approach to a child with wheezing including asthma
18. Introduction to newborn care, and classification of neonates.
19. Care of normal newborn
20. Breast feeding , weaning diets and lactation failure
21. Approach to a newborn with respiratory distress
22. Approach to jaundice in the newborn
23. Infections in the newborn

24. Perinatal asphyxia: etiology, clinical features and management
25. Approach to a child with bleeding & coagulation disorders
26. Approach to a child with malignancy
27. Approach to a child with congestive cardiac failure
28. Rheumatic fever: clinical features, management and prophylaxis
29. Approach to a child with congenital heart disease
30. Approach to a child with urinary tract infection including recurrent UTI
31. Approach to a child in coma
32. Approach to a child with acute flaccid paralysis
33. Neonatal seizures and febrile convulsions diagnosis and management
34. Approach to common genetic disorders including Downs Syndrome
35. Short stature, hypothyroidism: etiology and management
36. Adolescent growth, sexual maturation and disorders of Puberty

Practical Training

Practical training will be conducted in 4 phases

1) **IV-V Semester: Location – Out patient department**

   3 weeks posting in 4 batches of 12-13 students.

2) **VI Semester: Location – Pediatric wards**

   3 weeks posting in 4 batches of 12-13students. This is a ward posting

3) **VII Semester: Location – Ballabgarh**

   Once a week teaching session during the six weeks rural posting at Ballabgarh in 4 batches of 12-13 students

4) **VIII Semester: Location – Pediatric wards**

   3 weeks posting in 4 batches of 12-13students.

IV/ V Semester

Learning objectives (Skills)

1. Taking a detailed Pediatric history
2. Conducting physical examination of children
3. Understanding normal growth and development
4. Performing anthropometry and its interpretation
5. Developmental assessment of a child
6. Assessment of calorie/ protein intake and advise regarding feeding practice
7. Immunization schedule and administration
8. Evaluation and management of common OPD conditions
9. Medical conduct during patient examination

Clinical OPD cases (9.00 am – 12.00 Noon)

1. Tutorials and demonstration for first one week
2. Case discussion of common OPD conditions

Subjects for Tutorials cum demonstration

1. History taking I (Present, past and family)
2. History taking II (Antenatal, development, immunization, feeding)
3. General physical examination and Anthropometry
4. Developmental examination and interpretation of abnormal development
5. Assessment of nutritional intake and nutritional advice
6. Demonstration of BCG, OPV, DPT and Measles vaccination, Mx testing

List of OPD cases for discussion

1. Approach to a child with acute fever (evaluation and management of common febrile conditions including viral fever, enteric fever, malaria, UTI)
2. Approach to a child with chronic fever (evaluation and management of pulmonary tuberculosis)
3. Common viral exanthems including measles and chicken pox.
4. Common skin conditions including pyoderma, scabies
5. Common GI conditions including acute gastroenteritis, persistent diarrhea and infective hepatitis
6. Common respiratory conditions including viral URI, bacterial pharyngitis, laryngeal stridor and croup, acute lower respiratory tract infection (LRTI) and asthma.
7. Common CNS conditions including febrile seizures, epilepsy, developmental delay
8. Evaluation of normal infants for growth and development and advice regarding nutrition and immunization

VI Semester

Learning objectives (Skills)

1. Emphasis on Pediatric history taking, physical examination, anthropometry and assessment of growth and development
2. Care of normal newborn at birth and lying in ward
3. Counseling for breast feeding/ infant feeding
4. Evaluation and management of common fluid and electrolyte problems
5. Evaluation and management of common conditions related to Infectious diseases, Adolescent pediatrics, Respiratory tract, GI tract and Cardiovascular system.

Teaching schedule (9.00 am-1.00pm)

1. Ward rounds of the allotted beds:	9.30-10.30 am
2. Clinical case discussion:	10.30-12.00 noon
3. Tutorials/ Demonstration:	12.00-1.00 pm

Ward Rounds

Each student will be allotted 4 beds on the first day of the posting. The students are expected to maintain a diary of all the cases admitted on those 4 beds. The student should be acquainted with the diagnosis and day to day progress of the child. The rounds will be taken daily on a rotation basis.

Clinical case discussion

A. Neonatology

1. Neonatal history
2. Examination of newborn
3. Care of normal newborn at birth and lying in ward
4. Breast feeding
5. Management of common neonatal problems

B. Pediatrics

Clinical case discussion with emphasis on history taking, physical examination, nutrition and developmental assessment, differential diagnosis, investigations and management.

Case scenarios/ subjects for tutorials/ demonstration

1.	Monday	Neurological examination	SR Peds II
2.	Tuesday	Fluid therapy in children	SR Peds III
3.	Wednesday	Management of child with diarrhea, ORS	SR Peds I
4.	Thursday	Developmental assessment	SR Nursery
5.	Friday	Approach to URTI, LRTI	SR Peds ICU
6.	Monday	Practical aspects of anthropometry	SR Peds II
7.	Tuesday	Preparation of diet chart	SR Peds III/ Dietician
8.	Wednesday	Immunization: practical aspects	SR Peds I

VII Semester (Ballabgarh) Posting

Learning objectives (Skills)

1. Diagnosis and management of common conditions in community including diarrhea, respiratory tract infections, infections and malnutrition
2. Immunization
3. Newborn care at the community level
4. Awareness regarding National Health programmes

Teaching schedule (10.00 am-1.00 pm)

1. Clinical case discussion	10.00-11.30 am
2. Tutorials	11.30-1.00 pm

Clinical case discussion

1. Neonatal history taking, examination of newborn and breast-feeding.
2. Management of low birth weight including temperature regulation and sepsis
3. Case discussion of common pediatric conditions including diarrhea, malnutrition and lower respiratory tract infection

Subjects for tutorials/ demonstration

1. Newborn resuscitation
2. Common vaccines used in Pediatrics
3. Malnutrition and Vitamin deficiencies
4. National Health programmes specifically ICDS, DOTS, RCH and IMCI

VIII Semester

Learning Objectives (skills)

1. Re-emphasis on taking a detailed Pediatric history, conducting an appropriate physical and development examination of children including neonates, making a clinical diagnosis, interpreting common laboratory results and planning therapy
2. Evaluation and management of emergencies including neonatal and pediatric resuscitation
3. Management of neonates requiring special care (including low birth weight and preterm babies)
4. Exposure to diagnostic and therapeutic procedures such as intravenous access, naso-gastric feeding, venesection, pleural tap, ascitic tap, bone marrow aspiration, lumbar puncture, liver and kidney biopsy
5. Prescription writing for common disorders of childhood.

Teaching schedule (9.00 am-1.00pm)

1. Ward rounds of the allotted beds:	9.30-10.30 am
2. Clinical case discussion:	10.30-12.00 noon
3. Tutorials/Demonstration:	12.00-1.00 pm

Ward Rounds

Each student will be allotted 4 beds on the first day of the posting. The students are expected to maintain a diary of all the cases admitted on those 4 beds. The student should be acquainted with the diagnosis and day to day progress of the child. The rounds will be taken daily on a rotation basis.

Clinical case discussion

A. Neonatology

1. Normal newborn: History, examination, common problems, breast-feeding.
2. Management of low birth weight neonates (preterm neonates and IUGR neonates)
3. Management of neonatal jaundice
4. Identification of sick newborns

B. Pediatrics

Clinical case discussion with emphasis on history taking, physical examination, nutrition and developmental assessment, differential diagnosis, investigations and management.

Subjects for Tutorials/ Demonstration

1.	Monday	Instruments & Procedures I	SR Peds II
2.	Tuesday	Approach to a child with excessive crying	SR Peds III
3.	Wednesday	Aerosol therapy	SR Peds I
4.	Thursday	Neonatal resuscitation	SR Nursery
5.	Friday	Pediatric resuscitation	SR Peds ICU
6.	Monday	Instruments & Procedures II	SR Peds II
7.	Tuesday	Prescription writing for common disorders	SR Peds III
8.	Wednesday	Common X-rays in Pediatrics	SR Peds I

List of Xrays

1. Pneumonia
2. Primary complex, Miliary tuberculosis
3. Obstructive emphysema
4. Pleural effusion
5. Pneumothorax
6. Normal thymus
7. Congenital heart disease with increased/ decreased pulmonary blood flow
8. Rickets, scurvy, hemolytic anemia
9. Skull (suture separation, enlarged sella, and raised intracranial tension)

List of Instruments

1. Tuberculin syringe
2. Intravenous cannula
3. Ryle’s tube
4. Lumbar puncture needle
5. Bone marrow aspiration needle
6. Liver biopsy needle
7. Ambu bag and mask
8. Endotracheal tube
9. Laryngoscopes
10. Emergency drugs/ vaccine

List of Procedures

1. Injections (IM, IV, S/C, I/D)
2. Blood sampling, IV cannula insertion

3. Naso-gastric tube insertion
4. Lumbar puncture
5. Pleural/ Ascitic tap
6. Bone marrow aspiration
7. Liver/ Kidney biopsy
8. Peritoneal dialysis

RECOMMENDED READING BOOKS

Textbooks for Pediatrics

1. "Essentials of Pediatrics" by OP Ghai, Vinod K Paul and Piyush Gupta (latest edition)
2. "Care of the Newborn" by Meharban Singh (latest edition)

Reference Books

1. "Nelson Textbook of Pediatrics" by Richard E. Behrman, Robert M. Kliegman, Waldo E. Nelson and Victor C. Vaughan (latest edition)
2. "Rudolph's Pediatrics" by Abraham M. Rudolph, Julien IE Hoffman, Colin D. Rudolph and Paul Sagan (latest edition)

Clinical Methods

1. "Hutchison's Clinical Methods" by M Swash (latest edition)
2. "Pediatrics Clinical Methods" by Meharban Singh (latest edition)

ASSESSMENT AND DISTRIBUTION OF MARKS

Final Professional Examination

Theory paper

Duration of the theory paper shall be 3 hours. Total marks in final examination shall be 50. The theory paper will have 10 short notes, which will be divided into two sections A and B. Section A will have 5 short notes and section B will have 5 short notes. Both sections have to be answered on separate sheets. The content for these short notes will be divided as:

1. Short notes (2-3): Mortality indices and National programmes, Growth and development, Nutrition and Immunization
2. Short notes (2-3): Neonatology
3. Short notes (5-6): Emergencies and Systemic Pediatrics

Section A will have 5 short notes and will be set and evaluated by the external examiner The duration of this section will be 90 minutes. The content for this section will include all the above 3 components

Section B will have 5 short notes and will be set and evaluated by the internal examiner. The duration of this section will be 90 minutes. The content for this section will include all the above 3 components.

Practical

Total marks in final examination shall be 50

The practical examination will be held over 2 days, 25 students each day.

1. Long case 20 marks
2. Short case 10 marks
3. Newborn viva 10 marks
4. Viva voce 10 marks
   (Growth cards, nutrition tray, emergency drugs, instruments)

Pre-Professional Examination

The pattern will be similar except that the marks allotted will be half as compared to final assessment.

The division of marks for the subject of Pediatrics in the Final Professional examination will be as follows:

Total marks	200
Theory	100
Practical	100

Theory marks:

1.	Total for internal assessment	**25**
	IV semester	7.5
	VI semester	7.5
	VIII semester	10
2.	Pre-professional assessment	**25**
3.	Final professional assessment	**50**

Practical marks:

1.	Total for internal assessment	**25**
	IV semester	7.5
	VI semester	7.5
	VIII semester	10
2.	Pre-professional assessment	**25**
3.	Final professional assessment	**50**

PSYCHIATRY

BEHAVIOURAL SCIENCES – II SEMESTER

OBJECTIVES

At the end of the course, the student will be able to:

1. Understand human behaviour and its application in patient care.
2. Understand the concept of motivation, its impact on human behaviour and illness related behaviour.
3. Understand different types of emotions and their impact on health of the individual.
4. Define learning, comprehend different types of learning and conditioning. State methods of effective learning and demonstrate application of learning in treatment.
5. Understand different cognitive processes, comprehend memory process, describe short term memory and differentiate with long term memory., list causes of forgetting, and illustrate methods of improving memory.
6. Comprehend concept of thinking and its application to health care.
7. Understand nature of intelligence, explain growth of intelligence, compare role of heredity and environment in intellectual development. Method of assessment of intelligence.
8. Define personality, list determinants of personality, understand different theories of personality and learn methods of personality assessment.

COURSE CONTENTS

Behavioural Sciences – II Semester

1. Introduction: General introduction to Behavioural Psychology

   What is behavioural psychology, components, individual differences and applications of behavioural sciences in patient care and medical education.

2. Motivation

   Definition of motivation, theories, types –physiological and social motives, Maslow's hierarchy of

motives, clinical application

3. Emotion and its application to health

   Theories of emotions, type and impact on health.

4. Learning and conditioning.

   Components of learning, classical conditioning, operant conditioning, cognitive, social, biological and observational learning. Methods of effective learning, behaviour and cognitive therapy.

5. Cognitive process and memory

   Sensation, perception, illusion, memory process, short term and long term memory, causes of forgetting and methods to improve memory.

6. Thinking and problem solving

   Definition of thinking, components of thinking-imagery recollection, language, steps in problem solving, abnormalities in thinking, decision making.

7. Intelligence: General concepts and techniques for assessment.

   Theory of intelligence, growth of intelligence, stability of intelligence, determinants of intelligence, assessment of intelligence, extremes of intelligence.

8 Personality (Principles of Personality development) and objective testing of Personality

   Definition of personality, trait, factors influencing personality development, theories of personality and personality assessment.

   Method Teaching Lectures & Discussion Assessment – Nil

PSYCHIATRY (VI SEMESTER)

OBJECTIVES

At the end of the course, the student will be able to:

1. Introducing concept of psychiatric disorders and their classification
2. Awareness of general issues about etiology of psychiatric disorders and methodology used to study etiology of these disorders.
3. Ability to diagnose and treat common psychiatric disorders like schizophrenia, acute manic episode, depression, anxiety disorders including phobias and OCD, conversion and dissociative disorders.
4. To be able to diagnose severe/suicidal cases of depression and to refer them.
5. Understand the concept of personality disorders.
6. Ability to diagnosis and treat alcohol and drug dependence and withdrawal states.
7. Ability to diagnose common psychiatric disorders in children.
8. To know the role of counseling and psychological therapies in treatment of psychiatric disorders.
9. Demonstrate role of psychological testing in assessment of psychiatric disorders.

COURSE CONTENT

1. Introduction and classification of Psychiatric disorders

   Concept of psychiatric disorders; need for classification; types of classification e.g. atheoretical,

symptom – based; introducing the Inter national Classification of Diseases ((ICD) and the Diagnostic and Statistical Manual (DSM); major categories of psychiatric disorders; diagnosis of organic disorders.

2. Aetiology of Psychiatric disorders

   Overview of contribution of different scientific disciplines to psychiatric aetiology – clinical descriptive studies, epidemiology, social sciences e.g. role of life events, stress; genetics; biochemical studies; pharmacology; endocrinology; physiology; neuropathology; psychology.

3. Schizophrenia

   Epidemiology, clinical features, subtypes, diagnosis, overview of aetiology, course, treatment – pharmacological, role of ECT.

4. Bipolar disorders

   Epidemiology, clinical features, diagnosis, overview of aetiology, course, treatment – pharmacological.

5. Depression

   Epidemiology, clinical features, diagnosis, overview of aetiology, co-morbidity with organic disorders, course, treatment – pharmacological.

6. Anxiety neurosis, phobia and OCD

   Types of anxiety disorders; phobia, OCD, clinical features and epidemiology; diagnosis, differential diagnosis; overview of aetiology; course; treatment – pharmacological and non-pharmacological.

7. Hysterical neurosis (Conversion and Dissociative disorders)

   Epidemiology, clinical picture, diagnosis, differential diagnosis, aetiology, prognosis, treatment.

8. Personality disorders

   Concept of personality disorders, epidemiology, classification, assessment, overview of clinical features, aetiology, prognosis.

9. Drug and Alcohol dependence

   Concept of abuse and dependence, epidemiology of alcohol and opiate dependence; clinical features, withdrawal symptoms including complicated withdrawal, psychosocial complications, aetiology, outcome, treatment.

10. Psychiatric disorders of childhood and adolescence,

    Classification of childhood psychiatric disorders, epidemiology, clinical features, aetiology, assessment.

11. Counselling and psychological therapies

    Counselling process, skills, different counseling approaches, behaviour therapy, cognitive therapy and its applications.

12. Psychological testing

    What are psychological tests, standardization, reliability, validity, intelligence test, personality test, application.

TEACHING AND LEARNING METHODOLOGY

Lectures and discussions with patients

TEXT-BOOK RECOMMENDED

1. Niraj Ahuja's Text-book on Psychiatry
2. Oxford Psychiatry

EXAMINATION AND MARKS DISTRIBUTION

Internal Assessment : Two assessments - Viva are held as given below :

	Viva
IV/V Semester	- 6
VI/VIII Semester	- 6
Professional Examination	
Theory with medicine (paper – I)	25 marks
Theory with community medicine (Paper II)	25 marks

SURGERY

Aims of the surgical education for undergraduates are to develop a primary care physician with appropriate knowledge, skill and attitude to treat common disease at the primary care level. Emphasis will be laid on the primary care of the injured, care of comatose, common wounds and ulcers, resuscitation of patient with cardiac arrest, initial care of acute abdominal conditions and other emergencies. Diagnosis, workup and proper referral of common conditions viz. hernia, lumps in breast, thyroid, piles and fissure & fistula, abdominal lumps, renal stones, varicose veins will be covered substantially.

OBJECTIVES

Knowledge

At the end of the course, the student shall be able to:

1. Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children:
2. Define indications and methods for fluid and electrolyte replacement therapy including blood transfusion:
3. Define asepsis, disinfection and sterilization and recommend judicious use of anatibiotics:
4. Describe clinical features and risk factors of common malignancies in the country and their management including prevention.
5. Enumerate different types of anaesthetic agents, their indications, mode of administration, contraindications and side effects.

Skills

At the end of the course, the student should be able to:

1. Diagnose common surgical conditions both acute and chronic, in adult and children;
2. Plan various laboratory tests for surgical conditions and interpret the results;
3. Identify and manage patients of haemorrhagic, septicaemic and other types of shock;

4. Be able to maintain patent air-way and resuscitate a -
   (i) a critically injured patient;
   (ii) patient with cardio-respiratory failure;
   (iii) a drowning case.
5. Monitor patients of head, chest, spinal and abdominal injuries, both in adults and children;
6. Provide primary care for a patient of burns;
7. Acquire principles of operative surgery, including pre-operative, operative and post operative care and monitoring;
8. Treat open wounds including preventive measures against tetanus and gas gangrene;
9. Diagnose neonatal and paediatric surgical emergencies and provide sound primary care before referring the patient to secondary / tertiary centers;
10. Identify congenital anomalies and refer them for appropriate management.

COURSE CONTENT

A combination of system-based model and the spiral model is recommended for the MBBS course:

Pathogenesis, causes, epidemiology, Clinical Presentation, Investigations, and management of the diseases in the following systems:

1. **Skin**: ulcers and wounds, wound infections, burns, skin infections (boils, carbuncle, abcess), cysts (epidermoid cyst, dermoid),skin tumors(basal cell carcinoma, squamous cell carcinoma, melanoma).
2. **Head and Neck region**: congenital anomalies (cleft lip, cleft palate, branchial cyst and fistula, thyroglossal cyst) swellings of parotid and submandibular glands, oral ulcers, leukoplakia, submucous fibrosis, lichen planus, common jaw tumors, squamous carcinoma of oral cavity, pharynx & larynx. Thyroid swellings (adenomatous goitre, Graves' Disease, papillary and follicular thyroid cancer).Swellings of lymph nodes (tuberculosis, lymphoma, metastatic carcinoma)
3. **Arteries**: Features of limb Ischaemia, noninvasive vascular diagnostic tests, obliterative atheromatous disease, aneurysms, Raynaud's syndrome, arterial emboli.
4. **Veins**: varicose veins, deep vein thrombosis , pulmonary embolism.
5. **Breast**: mastalgia, ANDI, fibroadenoma, cyst, breast abscess, cancer of the breast.
6. **Oesophagus**: dysphagia, reflux, hiatus hernia, benign and malignant tumours.
7. **Stomach and duodenum**: Peptic ulcer- stomach and duodenum, carcinoma of the stomach, gastritis.
8. **Small intestine**: Small bowel obstruction, intestinal tuberculosis.
9. **Colon and rectum**: Amoebic colitis, Ulcerative colitis, colorectal cancer.
10. **Appendix**: Acute appendicitis.
11. **Anus:** Haemorrhoids, Pruritus ani, Fissure-in-ano, Anorectal abscesses, Fistula-in-ano, cancer of the anus.
12. **Peritoneum and intraperitoneal abscesses:** peritonitis.
13. **Liver:** Hepatic trauma, abscesses, cancer.

14. **Biliary tract:** gall stone disease, carcinoma of the gallbladder.
15. **Pancreas:** Acute panacreatitis, pancreatic cancer.
16. **Acute abdomen**
17. **Hernias of the abdominal wall:** Inguinal hernias, femoral hernia, umbilical and epigastric hernia.
18. **Urology:** Diagnostic studies and techniques in the urinary tract, trauma to the urinary tract, urinary calculi, urinary tract infection, prostatic hyperplasia, tumours of the kidney, epididymo-orchitis, hydrocele, tumours of the testicle, carcinoma of the penis.

TEACHING LEARNING METHODS

The following strategy is used for organizing teaching learning activities:

a) Lectures are used for teaching the basic principles for 4th semester students of surgery viz. infection, wound healing, shock, trauma.

b) Integrated seminars are utilized during the 6th and 8th semester for teaching system based surgery viz. thyroid and endocrine disorders, GIT, urinary, head and neck and vascular disorders.

c) Clinical teaching to a group of 12 students on surgical Inpatient Wards and OPD's.

d) Clinical skill training- We teach basic surgical skills to our final year students and interns in minor OT, casualty theatre and main theatre. In the department we also organize yearly workshop on suturing & knot tying where students get an opportunity to acquire hands-on experience on these important skills.

Guidelines for students posted in Department of Surgery

3rd – 4th Semester

This is the first introductory posting in surgery to provide orientation, towards the general functioning of the Department and the nature of clinical work performed in the Department of surgery. You will be posted in the surgical Out-patients department. This is a five weeks posting. The learning objectives for this session are to learn :

- the art and science of history taking,
- general evaluation of overall health;
- basic principles of examination of a lump;
- examination of hernia, hydrocoele and abdomen;
- examination of breast;
- examination of head and neck;
- evaluation of wounds, ulcers and sinuses.

You will be required to attend the surgical Out-patient clinic from 9.15 A.M. to 12.00 noon. Be punctual as any person coming to clinic after 9.30 A.M. will be marked absent. Attendance register will be sent to the Dean.

You are required to be properly dressed, wear a white coat, with a name plate (no jeans and no sneaker shoes please!). You are required to bring the following:-

A pen torch with metal tip, measuring tape, Vernier callipers, stethoscope, patella hammer;

Please read " Norman Browse- An Introduction to the symptoms and signs surgical diseases" or "Hamilton Bailey- Physical signs", in order to acquire theoretical background of clinical examination. A book by " S.Das " has many mistakes, and therefore, not recommended.

5th Semester

The learning objectives for this session are honing the skills of physical examination. You are again posted in the Out-patient surgical department. The timings are 9.15 A.M. to 12.00 A.M.. **Attendance is compulsory**. For this semester utilize your time in examining as many patients as possible. Visit the consultation rooms of all the consultants and senior registrars. Remember there is no substitute for seeing the patients.

You cannot acquire the practical skills by sitting in the Library.

A famous physician of USA, Sir William Osler said" ***To study the phenomena of disease without books is to sail an uncharted sea whilst to study books without patients is not to go to sea at all"***

Besides seeing patients you should also acquire the following basic surgical skills- wound dressing, debridement , abscess aspiration and drainage, excision biopsy of skin lesions, lipoma and epidermal cysts, skin suturing and knot tying, proctoscopy, rubber banding of piles.

Please attend minor surgical operation theatre situated at the end of the surgical OPD corridor to acquire the above skills. Please maintain a record of cases seen and surgical skills learnt in a **diary/log book.** You will be assessed on this.

Assessment of III – V Semesters

A weightage of 15 marks for III semester and 25 marks for IV & V semester will be given in the form of viva questions with short case presentations.

6th Semester

The learning objectives in the 6th semester are to master the skills of surgical diagnostic evaluation. You are advised to follow a **problem based approach (PBL**).

Greet the patient cheerfully with a smile and introduce yourself. Seek patient's permission for interrogation and examination (e.g. " I am_______, a 6th semester student of MBBS. Can I ask a few questions about your illness and can I examine you. This will help me in learning the diagnosis and in becoming a good doctor so that I may serve the society well). Be extremely polite in your approach. If patient refuses simply thank him and go to a next one. Ask presenting symptoms along with duration**.**

Formulate a diagnostic hypothesis (e) based on the patient's age, gender, place of living and initial symptoms. This is essentially a list of differential diagnoses. Think about pros and cons of each possibility.

Now ***ask details of the present and past history*** focused on the initial diagnostic hypothesis. For example-in a patient with bleeding P/R at age 40. If you have consider piles and cancer rectum as your diagnostic hypothesis, your interrogation should revolve around these two conditions with the objective of proving one and refuting the other.

After interrogation revise your diagnostic hypothesis(e) on the basis of historical facts. ***Perform a quick general exam*** and make a note of overall health status.

The next step is to carry out a ***detailed physical exam*** of the lump, swelling or ulcer. *Remember no*

exam of a swelling or ulcer is complete without checking the draining lymph nodes.

Make a diagrammatic representation of your findings with colour felt pens on your diary/log book. Go through the following checklist while seeing any lump: **number, site, size, shape, margin , surface, skin over it, structures superficial and deep to it, temperature over it, tenderness, consistency, transillumination, thrill or bruit and the regional nodes.**

Once again **revise** your diagnostic hypothesis. Generate a diagnostic workup plan (**Diagnostic decisions**).

Allocation of Units

Find **which unit** you are posted with? The first 12 students of the batch go with Surgical Unit 1 and Unit 3, while the remaining students are posted with Unit 2 and Unit4. Reverse this order during the 8th semester posting.

You will get 3 beds allotted to you. You are responsible for seeing all the patients admitted to these beds during your stay of 6 week with us. Record the history, exam findings and results of any investigations.

Assessment: OSCE = 12 marks with 3 clinical skills stations. Portfolio= 5 marks. Total=17 marks. Note these marks are added in the final MBBS exam result.

8th Semester Posting: This is again 6 weeks long posting on surgical wards. The learning objectives of this final session is to develop the competency in **making a diagnosis,** generating a **diagnostic decision plan** and outlining the **therapeutic decision.** During this period you have to accompany the patient to the operation theatre, assist in the operation, write postoperative orders and follow the postoperative recovery of the case. Write down the daily progress in your case records till the patient is discharged.

Perform dressings, I.V. line insertion, catheter and nasogastric tube insertion on your cases.

Assessment: OSCE= 13 marks with 3 clinical skills stations, diary/log book= 5 marks, Total =18 marks.

Objectives of Clinical Training

At the end of clinical posting in surgery, a student should be able to:

- Elicit a detailed & relevant history
- Carry out a physical examination
- Identify patients' problems
- Reach a differential diagnosis
- Formulate appropriate investigations
- Interpret the results of investigations
- Plan appropriate management
- Undertake some aspects of management
- Demonstrate adequate communication skills

TEXTBOOKS RECOMMENDED

(1) Short Practice of surgery- Bailey & Love

(2) ASI Text book of surgery Ed.A.K. HAI

(3) An introduction to the symptoms and signs of surgical Disease-Norman L. Browse
(4) Hamilton Bailey's Physical Signs in Surgery.
(5) Principles and Practice of Surgery Eds-Garden, Bradbury Forsythe.
(6) Pye's Surgical Handicraft.

ASSESSMENT AND EXAMINATION

The total weightage of 600 marks to Surgery comes from both internal and external assessment, viz., final professional examination in theory as well as practical. Since surgery included several specialties, the weightage often gets distributed amongst the specialties: Ophthalmology, E.N.T., Orthopedics, Anesthesiology, besides a little weightage for postings in Dental and Casualty. The distribution of marks can be divided in to four components as follows:

Theory:	
Final Professional Examination – Theory and viva voce -	150
Internal Assessment derived from allied specialties:	150
Practical:	
Final Practical and Clinical examination with Long and Short cases Consisting of allied surgical specialties:	150
Internal marks derived from allied specialties, and end semester Examination marks	150
Grand Total	600

Final Professional Exam in Surgery – Theory

Theory and viva-voce:		
(a) Paper I - General Surgery (including specialities)	60	150
(b) Paper-II		
Part I-General Surgery (including specialities)	30	
Part II-Ophthalmology	20	
Otorhinolaryngology	10	
(These shall include questions in Traumatic Surgery. Questions in other specialities, e.g. Orthopaedics and Anaesthesiology may also be included).		
(c) Viva-Voce	30	
(including Surgery and its specialities, Orthopaedics, Ophthalmology, Otorhinolaryngology and Anaesthesiology)		
Class work	150	
(This shall include Surgery, Ophthalmology, Otorhinolaryngology, Orthopaedic surgery, Anaesthesiology and End Semester Examination)		
Total	**300**	

(The 150 in the third column is bracketed against items (a) through (c).)

Practicals and Clinical

(a) Class work (including surgery, Otorhinolaryngology, Orthopaedics, Anaesthesiology and End Semester Examination)		150
(b) Clinical cases		150
Long and short (These shall include clinical cases in Ophthalmology and Otorhinolaryngology which shall be assigned 30% of the total marks for clinical cases. Clinical cases in other specialities e.g. Traumatic Surgery, Orthopaedic Surgery and Anaesthesiology may also be included).		
	Total	**300**

Types of Questions suggested

Theory :

Modified Essay Questions, Simulated Patient Management Problems (SPMP), Short Answer/ Short Notes, and MCQs;

Practical / Clinical Assessment:

Long Case, Short Case, Objective Structured Clinical Examination (OSCE)

Notes on OSCE

Objective Structured Clinical Examination (OSCE) has proved to be a valid, reliable and objective modality of assessment for assessing clinical skills. This involves breaking up clinical competence in to a series of clinical skills (history taking, performing physical examination, interpreting lab data, differential diagnosis, treatment & follow up), and testing each skill in a separate 'station'. Each station is provided with a real or simulated patient, mannequin, equipment, X-Ray, or even a question which should be tackled by a student within a prescribed time limit say, 2 – 5 minutes, on rotation basis. The performance is observed by an observer using a predetermined check list for assigning marks. A detailed discussion on the preparation of OSCE is beyond the scope of this book. However, a few tips have been given for initial introduction.

Principles of Designing OSCE

Define skill to be tested

- Break into steps
- 3-5 minutes to perform each task
- Observation by examiner

Scoring based on vital components of skill and precautions to be observed

- Provision for negative score, if necessary

Two types :Procedure stations (needs observer) and Question stations Skills that can be tested using OSCE

- History taking
- Physical examination
- Analysis of clinical data

- Observation and ability to recognize disease patterns
- Interpretation of investigations
- Performance of a procedure
  - Diagnostic
  - Therapeutic
- Problem solving skill
- Communication skill
- Others
  - Surgical/clinical instruments
  - Surgical specimens
  - Procedures on models/dummy
  - Patient education

A model OSCE for our 8th semester students is given below :. Conduct of an OSCE in surgery using 7 stations

Station 1

(History taking skill)

- Take the history of this patient who has sudden onset right lower abdominal pain

Marks :6

Checklist

The student questions the patients about

history of pain 1

history of vomiting 1

history of fever 1

history of previous surgery 1

Attitudes and communication (gentle approach) 1

General proficiency 1

Station 2

(Physical Examination skill)

Examine the neck swelling of this patient. You are being observed by the examiner for your skills in physical examination and your attitude towards the patient.

Marks:10

Checklist

Student looks for the following parameters

a) movement with swallowing 1

b)	examination of each lobe of thyroid	1
c)	relationship with sternocleidomastoid	1
d)	testing for retrosternal extension	1
e)	palpation of carotids	1
f)	elicitation of signs for airway obstruction	0.5
g)	examination of cervical lymph nodes	0.5
h)	auscultation over the swelling	0.5
i)	Positions patient properly to examine neck swelling	1.5
j)	correct sequence of procedures	0.5

Attitude towards patient

k) . explains procedure	0.5
l). causes minimal discomfort to the patient	0.5
General proficiency	0.5

Station 3

(Procedural skill)

Apply a Pressure bandage to stop bleeding from cut wrist :

Marks:10

Check-list

Explains the procedure to the patient	1
Follows properly the steps of the procedure:	
• a) positioning of the patient: supine	2
• b) positioning of the limb: straight	2
• c) properly tying the bandage	2
• Performs the procedure confidently and gently	1
• Explains the following aftercare to the patient	
a) finger movements	1
• b) warns about swelling of fingers & to report immediately if severe pain or swelling occurs	1

Station 4

Palpate the abdomen of this patient (Has a generalised liver enlargement)

Marks: 7

Check list:

1. Explains the procedure and approaches to him gently	1
2. Inspects the abdomen first	1

3.	Starts palpating from lower abdomen first	1
4.	Palpates the whole of anterior surface of liver and its entire lower border	2
5.	Percusses for dullness over liver and its upper border	2

Station 5

Questions based on **station 5**: Marks : 5

Q1.	Describe your findings (if correctly described)	1
Q2.	Enumerate 2 most probable causes of this condition (mentions obstruction of common bile duct, congestive heart failure)	2
Q3.	Mention : one blood test (mentions LFT)	1
	: one imaging technique for this patient (mentions Ultrasound)	1

Station 6

Skill Station: Problem: An adult male met with an accident on the road and has come to the casualty with a clean lacerated wound on the abdomen. Demonstrate suturing of this wound using the skin simulator provided. Put 3 interrupted sutures. Note that skin edges have a tendency to invert.

Marks: 19

CHECK LIST FOR SKIN SUTURING

INSTRUCTIONS TO CANDIDATES

Suture the clean incised wound with interrupted sutures

ITEM		**Done correctly**	**Not Done correctly**
1.	Selects appropriate suture, needle holder and forceps.	1	0
2.	Needle loaded ½ to 2/3 from tip.	1	0
3.	Bite distance from the skin edge-5mm.	1	0
4.	Angle at which bite taken - 90^0	1	0
5.	Single attempt while taking bites in the skin	1	0
6.	Movement occurs at wrist	1	0
7.	Forceps used to hold skin or subcutaneous tissues (minimum use)	1	0
8.	Whether takes bites from both skin edges in one go or separately1	0	
9.	Equal bites on both sides	1	0
10.	Whether needle touched with hand	1	0

11. Number of knots taken	1	0
12. Knot is square or not.	1	0
13. Knot is too tight or too loose.	1	0
14. Suture breaks or not	1	0
15. Knot is on the incision line or on one side	1	0
16. Distance of cutting the suture from the knot	1	0
17. Suture board moves or not	1	0
18. Skin edges are everted or inverted	1	0
19. Inter sutural distance – 0.5 to 1cm.	1	0

MAXIMUM TOTAL SCORE (19)

TOTAL SCORE

EXAMINER ______________________

Station 7

Marks: 10

Look at the x-ray on the view box and answer the following:

1.	Name the special film taken (mentions barium meal for stomach and duodenum)	1
2.	Describe the abnormality (mentions gastric dilatation, block in duodenum and no filling defect in stomach)	2
3.	Name the disease producing these features (mentions chronic duodenal ulcer with gastric outlet obstruction)	3
4.	List 2 main symptoms this patient would have presented with (mentions projectile vomitings and epigastric pain)	2
5.	List 2 main water and electrolyte disturbances seen in such cases (mentions metabolic alkalosis, or hypokalemia or paradoxical aciduria)	2

INTERNSHIP

The total duration of Internship at AIIMS is one year on rotation basis. The details of Posting are as follows:

Specialty	**-**	**Duration**
Medicine	-	1 ½ months
Surgery	-	1 ½ months
Rural	-	3 months
Paediatrics	-	1 month
Obst. & Gynae.	-	1 month
Casualty	-	1 month
Anaesthesiology	-	15 days
Ophthalmology	-	15 days
Elective	-	2 months
Total		12 months

During Internship emphasis will be laid on practical "hands-on" experience. The concerned departments will be encouraged to develop a diary / log book which gives details of tasks / cases to be seen by the interns.